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## ABSTRACT

This book, written to help educators with little or no experience in tech prep, presents a step-by-step process showing how to plan, develop, and implement a tech prep program. It shows how schools can work collaboratively with businesses to organize programs that give students the core, technical, and specialty skills and proficiencies they need. The first 5 chapters of the 10-chapter book focus on learning about tech prep and getting started. They cover the following topics: (1) the need for tech prep; (2) how the program works; (3) creating a tech prep consortium; (4) getting started (creating vision and mission statements); and (5) organizing the teams (the consortium, the local school district, and the postsecondary school). The remaining five chapters provide more action steps to get the job done: (1) conducting inservices on tech prep; (2) making curriculum changes and creating a more interactive, integrated, and applied learning environment for students; (3) involving businesses in the program; (4) building a campaign to promote the program; and (5) tracking the program's success through evaluation. Three appendices contain definitions, core proficiencies, and a tech prep checklist. A bibliography contains 20 references and sources for more information. (KC)

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# Tech Prep Career Programs

## *A Practical Guide to Preparing Students for High-Tech, High-Skill, High-Wage Opportunities*

**Revised Edition**

**Carol Fagan  
Dan Lumley**

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# **Tech Prep Career Programs**

In loving memory of Pauline Fagan

# **Tech Prep Career Programs**

***A Practical Guide to  
Preparing Students for  
High-Tech, High-Skill,  
High-Wage Opportunities***

***Revised Edition***

**Carol Fagan  
Dan Lumley**



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## *About the Authors*

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# *Introduction: Preparing Students for Careers*

Educators have a responsibility to prepare students for the challenges of tomorrow. Those who work in or with secondary or postsecondary education have a unique mandate and a call to action: to prepare students for the high-tech, high-skill, high-wage careers that will allow them to successfully compete in our changing economy. It will take superintendents, counselors, curriculum coordinators, principals, teachers, deans, directors, and many others working together to achieve these goals.

We have been impressed with the changes that have occurred in the Johnson/Douglas Counties Tech Prep Associate Degree consortium schools since the beginning of our Tech Prep work. We have seen students and teachers come alive. More high school students are taking more math and science than ever before. This has increased the competency levels in these areas dramatically. One school reports students coming in before school starts (by choice) to work in the science/technology lab. Teachers, who were once isolated in their own classroom, are now team teaching, working on curriculum with their colleagues, and seeking new approaches to teaching. Students can now receive college credit for the technical classes they take during high school. If you want these kinds of

changes to occur in your school, we highly recommend Tech Prep as a way to implement change.

Technical Preparation (Tech Prep) links high schools with community colleges and businesses to present a sequence of courses for students. This sequence provides skills for the growing occupations and careers of tomorrow. A Tech Prep program will provide a map for you as you change the way business is done in your school. The initiative requires planning, organization, and much endurance.

This book is written to help educators with little or no experience in Tech Prep. It presents a step-by-step process on how to plan, develop, and implement the program. It shows how schools can work collaboratively with businesses to organize programs that give students the core, technical, and specialty skills and proficiencies they need.

The first five chapters focus on learning about Tech Prep and getting started. Chapter 1 helps you understand the workplace which students will enter when they leave school. Knowing the challenges students will face allows educators to prepare them appropriately. Chapter 2 helps you focus your efforts on what is most important for your students. This chapter reviews how students benefit, how you can make Tech Prep work, and what you need to do to keep the program on track. Chapter 3 provides guidance on how you can organize your own consortium and begin to put the process in motion. Chapter 4 helps you define your own Tech Prep program and set some boundaries. Knowing what kind of goals to set is a crucial step in getting started. Once you've begun, Chapter 5 will help you organize your efforts and create action teams and work groups to get the job done.

Chapter 6 provides everything you need to conduct inservices on Tech Prep, including suggestions on how to give presentations and who to give them to, as well as transparency masters. Chapter 7 explains how to make needed curriculum changes and create a more interactive, integrated, and applied learning environment for students. Chapter 8 outlines the first steps to involve businesses in your efforts. Chapter 9 helps you build a campaign to promote your program. Finally, Chapter 10 helps you find out if your efforts are making a difference and how to measure your successes.

We have provided several additional resources for your use. Resource A includes basic definitions for getting started. Resource B helps identify the core proficiencies used in your own consortium. Resource C is a checklist to help you monitor your progress. A Bibliography, with a list of sources of additional information, is also provided.

Please treat this manual as a starting point. Seek out other educators who are involved in Tech Prep programs. Listen to futurists talk about tomorrow, and keep track of the demographic changes the United States is undergoing. Good luck and keep in touch.

## Need for Tech Prep

If Horace Mann were to walk the halls of a typical 20th century school, he would feel at home among the paper, pencils, chalkboards, and textbooks. He would quickly recognize students recalling facts from short-term memory, a curriculum segregated into separate subjects, standardized tests, and teachers being "the sage on the stage" pouring facts into empty vessels. On the other hand, if Horace Mann were to visit a modern business or organization, he would probably feel lost among the technology and workplace climate. Schools are in a precarious position because they have not kept pace with workplace changes. While organizations and businesses have been going through a metamorphosis, education is still mired in 19th-century curriculum and instruction patterns.

School leaders must create change within the education system. The United States must produce graduates who can perform effectively in the changing workplace. In order to do this, we must understand recent trends in the workplace. Only then can we begin to build a system that will accomplish our goal. Not only must leadership be evident at all levels of the education system, but cooperation must exist among these levels. Primary, secondary, and postsecondary schools must work cooperatively to accomplish the goal of producing a workforce for today and tomorrow. Tech Prep is a program that links secondary education, postsecondary education, and the workplace. Tech Prep presents students with a path-

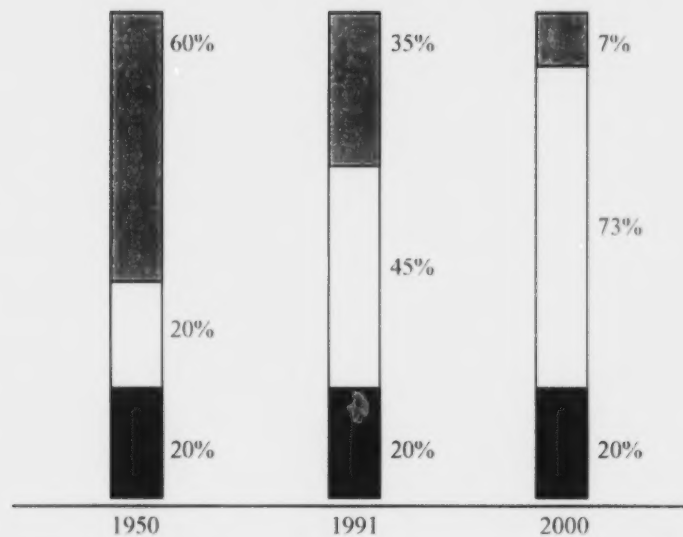


**Chart 1.1.** Job Skill Level Changes

SOURCE: U.S. Bureau of Labor Statistics.

way to their future. It is an exciting change that is affecting students all over the United States.

## Changes in the Workplace

Several changes in the workplace have created a need for school reform. One change is an increase in workplace technology, coupled with the growth of mid-level technical careers. A second change is a shift in the level of education required. Finally, the third change is a shift in the role of the employee.

### Workplace Technology and Growing Mid-Level Technical Careers

The workplace has shifted from unskilled to skilled employment. Chart 1.1 illustrates this shift over time.

Three conclusions are clear from the chart on Job Skill Level Changes:

1. The percentage of unskilled jobs is decreasing
2. The percentage of skilled jobs is increasing
3. The percentage of professional jobs is remaining constant

The shift from unskilled to skilled jobs is primarily a result of the increasing use of technology in the workplace. Every employ-

ment sector has been affected by this shift. Examples of the shift from unskilled to skilled jobs are identified below.

- Agriculture has moved from the plow to hydroponics and bioengineered foods
- Manufacturing has shifted from manual labor to robotics
- Service has shifted from a "paper-packed" workplace to a computer-driven environment

Jobs in every sector of the labor market are being shifted from unskilled to skilled by the influx of technology. As this shift occurs, the need for technical education increases.



### Level of Education Required for Work

The United States Department of Labor, Bureau of Labor Statistics, released new occupational projections and training data in January 1996. Chart 1.2 summarizes the new category system now being used to report data on employment and level of education.

The chart provides a snapshot of the number of people employed in the occupations studied, the number of occupations available, and the level of education required for each. Four important observations should be noted from the data.

1. Fifty six percent of the occupations require training beyond high school but less than a 4 year degree
2. Only 22% of the occupations require a 4 year degree or more
3. More people are employed in the jobs that require training beyond high school but less than a 4 year degree than in any other category
4. Four out of every 10 jobs will be filled at the lowest level of training (a few days of on-the-job training); however, these are also the lowest paying jobs

These data do not support the traditional belief that all students need a 4 year college degree. The data do indicate that students need some post-high school training to obtain employment. Although

| NUMBER OF<br>OCCUPATIONS | NUMBER OF<br>PEOPLE EMPLOYED | LEVEL OF<br>EDUCATION |
|--------------------------|------------------------------|-----------------------|
| 6                        | 1.0                          | DOCTORATE             |
| 10                       | 1.4                          | MASTERS               |
| 16                       | 2.4                          | PROFESSIONAL          |
| 8                        | 1.7                          | BACHELOR + 2 YRS      |
| 14                       | 8.1                          | BACHELOR + WORK EXP   |
| 64                       | 13.9                         | BACHELOR              |
| 16                       | 4.0                          | ASSOCIATE             |
| 29                       | 7.2                          | POSTSECONDARY         |
| 39                       | 9.9                          | RELATED WORK EXPER    |
| 89                       | 13.7                         | > 12 MONTHS OJT       |
| 119                      | 16.2                         | 1-12 MONTHS OJT       |
| 120                      | 49.7                         | FEW DAYS OJT          |

**Chart 1.2.** Employment Data

SOURCE: U.S. Department of Labor.

these data focus on current occupations, the new projections for the fastest growing occupations and the occupations with the largest numerical increases are also available. These data are in Charts 1.3 and 1.4.

### The Changing Role of the Employee

The third shift occurring in the workplace focuses on the role of the employee. Organizations now expect workers to be active members of the workplace. Techniques like total quality management require that employees be directly involved in solving the problems of the workplace. Employees are expected to "bring their brains to work" rather than "checking them at the door."

The skills today's workers need were identified in 1988 in a report titled *Workplace Basics: The Skills Employers Want*. These skills are identified in Box 1.1.

Another important publication produced in 1991 by the Secretary's Commission on Achieving Necessary Skills (SCANS) called for teaching the same types of skills. The SCANS report recommended a three-part foundation of skills as well as five competencies. These recommendations appear below.

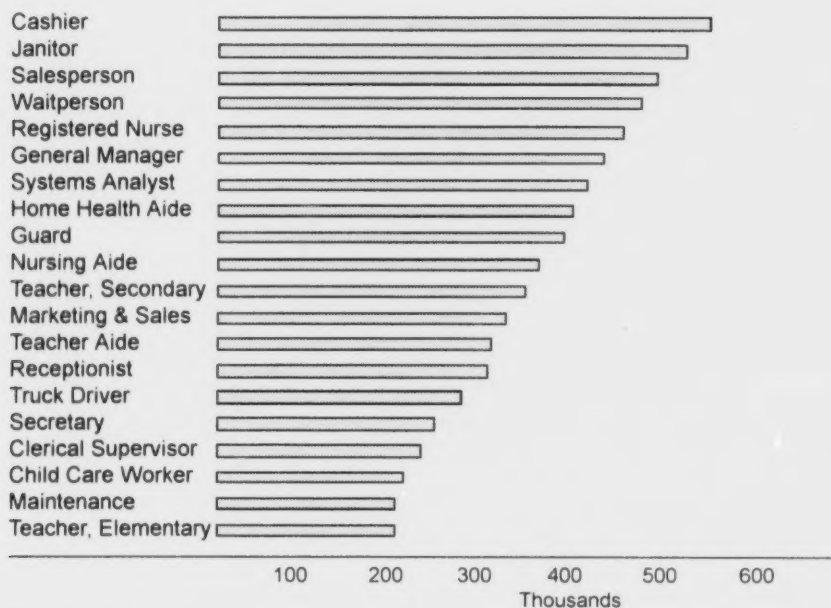


**Chart 1.3.** Occupations Having the Largest Numerical Increase in Employment, 1994-2005

SOURCE: U.S. Department of Labor.

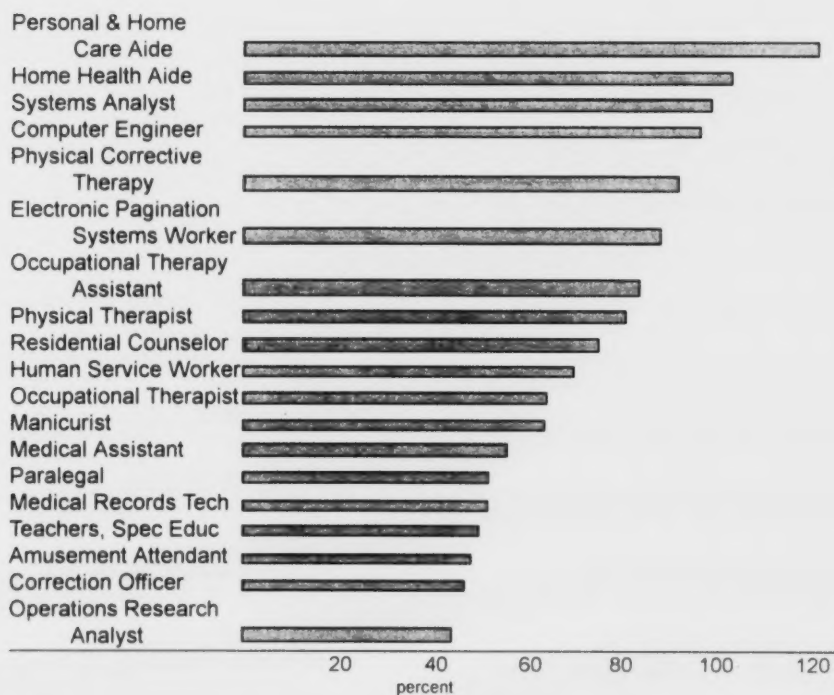


**Chart 1.4.** Occupations Projected to Grow the Fastest, 1994-2005

SOURCE: U.S. Department of Labor.

**BOX 1.1**  
**New Basic Skills**

Learning to Learn  
Reading, Writing, Computation  
Listening and Oral Communication  
Creative Thinking/Problem Solving  
Personal and Career Development  
Negotiation and Teamwork  
Organizational Effectiveness

SOURCE: Adapted from *Workplace Basics: The Skills Employers Want*, Carnevale, Gainer, and Meltzer, © copyright 1988 by U.S. Department of Labor, Employment and Training Administration. Reprinted with permission.

**SCANS, SKILLS, AND COMPETENCIES***A Three-Part Foundation***Basic Skills**

Reads, writes, performs arithmetic and mathematical operations, listens, and speaks

**Thinking Skills**

Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn, and reasons

**Personal Qualities**

Displays responsibility, self-esteem, sociability, self-management, integrity and honesty

*Five Competencies***Resources**

Time, money, material and facilities, human

**Interpersonal**

Team, teaching, serve clients, leadership, negotiates, works with diversity

**Information**

Acquires and evaluates, organizes and maintains, interprets and communicates, uses computers to process.

| HIGH SCHOOL COURSES  | POST HIGH SCHOOL GOAL           |
|----------------------|---------------------------------|
| COLLEGE PREPARATORY  | FOUR YEAR<br>UNIVERSITY/COLLEGE |
| VOCATIONAL EDUCATION | EMPLOYMENT                      |
| GENERAL EDUCATION*   | ?                               |

\* These students are often referred to as the neglected majority.

**Chart 1.5. The Current Focus of Education**

SOURCE: Adapted from *Tech Prep Associate Degree: A Win/Win Experience*, Hull and Parnell, © copyright 1991 by CORD Communications. Reprinted with permission.

NOTE: The term "the neglected majority" comes from Dale Parnell, *The Neglected Majority* (Washington, DC: The Community College Press, 1985).

**Systems**

Understands, monitors, and corrects performance, improves or designs

**Technology**

Selects, applies, maintains, and troubleshoots

SOURCE: Adapted from *What Work Requires of Schools: A SCANS Report for America 2000*, Secretary's Commission on Achieving Necessary Skills, © copyright 1991 by U.S. Department of Labor. Reprinted with permission.

**The Current Focus of Education**

If we are to respond to the changing workplace, we must do two things: produce more qualified workers and educate all students. To do this, we must change the status quo. Chart 1.5 is a diagram illustrating the current system of education at many high schools.

**The Tracks in Education**

Most educators are familiar with the three "tracks" in Chart 1.5, but they often deny that such "tracks" exist within their own school. There is usually a definite sequence of courses suggested for college preparatory and vocational students. General education students, however, typically drift along without direction.

Students who enroll in college preparatory courses are well equipped to enter a 4 year college or university. These students

*Regardless of which high school course sequence a student takes, he or she is at a disadvantage in the job market and the workplace. "College preparatory" students lack specific skill knowledge, "vocational students" lack the theoretical foundations and the requirements for promotion, and "general education" students lack specific skill knowledge needed for promotion as well as the theoretical foundations of subject areas.*

usually have no skill training because their curriculum includes an emphasis on theory rather than application.

Students who enroll in vocational courses are well equipped to enter the workforce in a specific career. The curriculum in the vocational courses focuses on the application of content rather than theoretical foundations. Vocational students are able to obtain employment; however, they often must return to education to receive a degree and advance their career.

Students who enroll in general education courses are not equipped to enter a 4 year college/university, nor are they able to obtain work in a "skilled" position. These students do not receive skill training or theoretical foundations within the curriculum. They see little relevance to their education and are therefore not motivated to perform.

### **What Happens to High School Graduates?**

It is estimated that approximately half of all high school graduates enroll in a 4 year degree program immediately after high school. Chart 1.6 illustrates specifically what happens to students in the years following high school.

### **How Tech Prep Can Make a Difference**

Tech Prep is a program that responds to the changing needs of the workplace. It prepares students to use technology and work in the growing number of mid-level technical careers. Tech Prep focuses students toward a 2 year degree or certificate, and it provides training in workplace skills.

### **Tradition vs. Tech Prep**

Chart 1.7 offers a comparison between the traditional classroom and a Tech Prep classroom.

### What Happens to High School Graduates?\*\*

|      |                                                                                                                   |
|------|-------------------------------------------------------------------------------------------------------------------|
| 1980 | 55% Entered a four year College/University<br>45% Did not enter college                                           |
| 1982 | 31% Were still enrolled in college<br>67% Were not enrolled in college                                            |
| 1987 | 24% Received a Bachelor's degree<br>8% Arts & Sciences<br>16% Professional Fields<br>76% Did not receive a degree |

\*\* Longitudinal study by ETS.

**Chart 1.6.** What Happens to High School Graduates?

SOURCE: Adapted from *Performance at the Top: From Elementary Through Graduate School*, Policy Information Center, Educational Testing Service, © copyright 1991 by Educational Testing Service. Reprinted with permission.

#### TRADITIONAL CLASSROOM

#### TECH PREP CLASSROOM

|                                         |                                            |
|-----------------------------------------|--------------------------------------------|
| Courses selected at random              | Courses selected from sequence of courses  |
| Teacher plays a "Sage on the stage"     | Teacher plays a facilitator for students   |
| Courses are presented as stand alone    | Courses are integrated with many subjects  |
| Workplace skills are not covered        | Workplace skills are within the curriculum |
| Students have little or no career focus | Students select a career cluster to pursue |
| Teachers work in isolation              | Teachers work in teams                     |

**Chart 1.7.**

Tech Prep is a program that puts many pieces of the reform puzzle together. It allows students to take challenging coursework, encourages teachers to use applied and integrated teaching strategies, provides a smooth transition to postsecondary education programs, and allows all students to benefit from these changes.

Tech Prep can create as much or as little reform as you make happen. This manual will help you create a Tech Prep program designed for your students, teachers, staff, community, and businesses.

### **A Local Perspective on Tech Prep**

The school districts within the Tech Prep Associate Degree Consortium of Johnson/Douglas Counties have been working on Tech Prep for 5 years and are observing the following changes:

- Increased student motivation
- Increased teacher motivation
- Supportive parents and media
- Raised self-concept in students
- Higher expectations of students
- Higher academic performance of students

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# *How the Program Works*

## **The Components of a Tech Prep Program**

If you asked seven different people what a Tech Prep program is, you might receive seven different answers. Despite this, there are some components that appear consistently in Tech Prep programs. The components listed below and discussed in the following pages provide a detailed definition of a Tech Prep program.

1. Course sequences
2. Course sequences built around careers or career clusters
3. Three levels of proficiencies (core, technical, and specialty)
4. High school and postsecondary curriculum
5. Application-based teaching strategies
6. Integration of disciplines and subjects
7. Involvement of business and industry

## **Tech Prep Programs Build Sequences of Courses**

The Tech Prep course sequence begins in high school and extends into postsecondary education. Typically, the sequence begins in grade 9 and extends through grade 14. Both academic and technical courses are included in the sequence required of Tech Prep students.

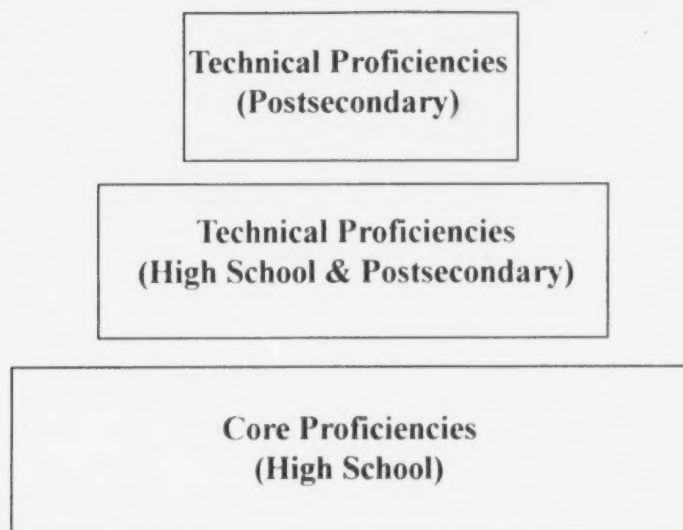


**Chart 2.1.**

SOURCE: Adapted from *Tech Prep Associate Degree: A Win/Win Experience*, Hull and Parnell, © copyright 1991 by CORD Communications. Reprinted with permission.

### **Course Sequences Are Built Around Career Clusters**

A career cluster usually includes a variety of related occupations. Typical career clusters found in Tech Prep programs include Engineering Technology, Health Services, Business and Information Technology, Human Services, Industrial Technology, and Agricultural Technology. Career clusters should be identified based on labor market trends. Tech Prep programs should build education programs in career clusters that show growth patterns in the employment market.

### **Tech Prep Programs Typically Are Built Around Three Levels of Proficiencies**

These proficiencies are taught across the high school, technical school, and college curriculum. Level 1 consists of core proficiencies, Level 2 consists of technical proficiencies, and Level 3 consists of specialty proficiencies. Chart 2.1 illustrates these proficiency levels.

#### *Level 1: Core Proficiencies*

The first set of proficiencies typically is taught in high school. Some people consider these proficiencies the "basic skills" for tomorrow's workplace. The core proficiencies include mathematics,

science, communication, and technology. Some Tech Prep programs, however, add workplace and career development proficiencies to this list. All Tech Prep students focus on the same core proficiencies regardless of the career or career cluster they are interested in.

#### *Level 2: Technical Proficiencies*

The second set of proficiencies can be taught at the high school, technical school, or college level. Where these proficiencies are taught will depend on the technical programs available within your consortium schools. Technical proficiencies introduce students to a career area by providing introductory skill instruction. For example, students interested in an engineering career might attain technical proficiencies in drafting or electronics at this level of the program. Students interested in a career in business might attain technical proficiencies in computer applications at this level. This is usually the first opportunity students have to explore specific careers without having to make a commitment to one particular career.

#### *Level 3: Specialty Proficiencies*

The third set of proficiencies is taught at the technical school or college level. Specialty proficiencies provide the students skill training for an occupation. For example, at this level engineering students attain skills in advanced computer-aided drafting and design. Students in a business cluster work on advanced office management proficiencies at this level. These courses provide the specific skills needed for entrance into the workforce.

### **High School and Postsecondary Curriculum**

The three proficiency levels are taught within courses across high school and postsecondary institutions. The core proficiencies are taught at the high school. Technical proficiencies are taught at the high school and/or at a technical school. The specialty proficiencies are covered at the postsecondary level. Coordination between the high school and postsecondary school is essential to ensure that courses are not duplicated and that students have the necessary skills to enter the program at the postsecondary level.

### **Application-Based Teaching Strategies**

Tech Prep programs build curriculum around the integration of academic and technical learning. When academic and technical

courses are integrated, students see connections between the classroom and the world of work. Students in math class, for example, learn how the skills they are learning are used on the job. Coordination between the high school and postsecondary school is essential to ensure that courses are not duplicated and that students have the prerequisite skills to enter the program at the postsecondary level.

### **Integration of Disciplines and Subjects**

A Tech Prep curriculum builds strong ties among disciplines and subjects. Two specific integration levels are stressed in Tech Prep programs. First, students must understand how components within subject areas are related to one another. For example, how are chemistry, physics, and biology related? How is algebra related to geometry and statistics? Second, students must understand how disciplines are related to one another. Here we refer to the relationships between physics and music, or between science and mathematics. Tech Prep students leave high school with one large box that contains knowledge and skills rather than separate boxes with labels such as geometry, biology, and language arts.

### **Involvement of Business and Industry**

One of the major goals of Tech Prep is to increase linkages between education and business. Involving business and industry representatives in the Tech Prep program is important to building a strong, work-based curriculum. Business representatives can be involved in Tech Prep in a variety of ways.

## **How a Tech Prep Program Will Help Students**

Most Tech Prep programs have just begun to collect data on the impact of Tech Prep. Tech Prep practitioners often cite the following benefits as arising, at least in part, from their Tech Prep programs. Tech Prep programs are designed to do the following.

### **1. Raise the Academic Performance Levels of Students in Mathematics, English, Technology, and Science**

Many students stop taking math and science courses in their sophomore year of high school, and most students never take technology-related courses at all. By encouraging or requiring students to enroll in more math, science, and technology courses and

by teaching those courses using application teaching strategies, we can raise their academic performance.

## **2. Increase Student Motivation to Learn**

Tech Prep courses present concepts by grounding them in work-place application. When students begin to understand how mathematics, for example, is used outside the classroom, they stop asking, "When am I ever going to use this?" and become involved in learning.

## **3. Connect High School With College by Providing a Coordinated Sequence of Courses**

Tech Prep programs build sequences of courses that begin in high school and culminate with a 2 year postsecondary degree or certificate. These sequences provide a smooth transition for students from high school to college and ensure that coursework is not duplicative. When programs are coordinated in this manner, students are prepared for the next level of education.

## **4. Decrease Dropout Rates of High School Students**

Tech Prep programs, when used to replace the "general education" program, can help to reduce the number of high school dropouts. The Tech Prep program provides direction and challenge that students often do not have in the "general education" program.

## **5. Increase Students' Preparedness to Enter College Degree Programs**

As Tech Prep program students progress through the recommended sequence of courses, they will attain high levels of mathematics, science, and technology skills. Because the course sequence has been designed jointly by high school and college faculty, students are well prepared to enter postsecondary programs. Tech Prep students will bypass the remedial courses offered in many postsecondary institutions.

## **6. Increase Skill Levels of Graduates**

As Tech Prep students enter the postsecondary portion of the program, they will be entering with high levels of math, science, and technology skills. The postsecondary institutions may then raise the content levels of their programs. Raising the content covered in postsecondary degree programs will allow students to attain higher skill levels at the completion of the program.

### **7. Provide Age-Appropriate School-to-Work Transition Activities**

Involving business and industry representatives in the Tech Prep program will help students stay closely related to their career interests. Students should have the opportunity to investigate and explore various careers as they move from junior high or middle school to high school and on into postsecondary education.

### **8. Provide Information on Career Opportunities for Community College Graduates**

The Tech Prep program focuses attention on careers of the future and the skills necessary to succeed in them. Research predicts that 80% of future new jobs will require less than a bachelor's degree. Providing current career and labor market information helps students and parents make appropriate career decisions.

## **Making Tech Prep Work**

### **Consortium Commitment**

All consortium members must be committed to building a Tech Prep program. Everyone is important to making the Tech Prep program work. Gaining active support for the program from all participants is a key element in the program's success.

### **Administrative Commitment**

The commitment to a Tech Prep program at the administrative level is one of the most important pieces of an effective program. Faculty and staff members will not be able to make the changes required by the program if administrators and board members are not solidly behind the changes.

### **Persistence**

The Tech Prep program will not appear overnight; in fact, if it does, you should be suspicious. Typically, faculty members and counselors must first believe that change is needed. The changes made within a Tech Prep program are complex and cannot be made all at once. The easiest way to approach the changes is to identify a small task and work on accomplishing that one task. Once the first small task has been accomplished, you can carve out the next task.

## Resources

Several kinds of resources will be needed to implement a Tech Prep program. These resources include planning time, funding to support equipment needs, in-service programs, and time to meet with faculty from the postsecondary level.

## Essential Roles in a Tech Prep Program

It is essential to have many people involved in a Tech Prep program. The following section suggests specific roles for some personnel within a Tech Prep program. This is not a comprehensive list of roles. For organizational purposes, we have divided these roles into consortium, secondary, and postsecondary categories.

### Consortium Roles

#### *Coordinator/Director*

The Tech Prep director focuses on organizing and coordinating the consortium activities. A common mistake is for a consortium to hire a director and believe that the director will create the program. It is impossible for the director to implement Tech Prep alone. The director cannot create change within each school; that must be done by local school personnel.

### Secondary Roles

#### *Superintendent/Assistant Superintendent*

The superintendent may serve on the steering committee (chapter 3) and provide visibility for the program within the home district. This might be done by keeping the school board and community informed and involved with Tech Prep efforts. The superintendent should also stay in communication with other Tech Prep consortium administrators.

#### *Curriculum Director*

The curriculum director should serve a major role in the development of Tech Prep at the local level. This person should also serve on the curriculum work team. It would be helpful to have this person serve as chairperson of the action team.

### *Principal*

The principal should provide leadership within the high school to keep Tech Prep efforts moving. The principal may serve as chairperson of the building team and as a member of the district action team (chapter 5). Providing support for teachers who work on curriculum or articulation is also important for the principal. Encouraging teachers and staff to be creative and supporting that creativity with funding (if necessary) is crucial to making the program work.

### *Teachers*

Teachers serve as members of the district action team and the building team. In this capacity, they should plan the district/building efforts for Tech Prep. It is also important for these teachers to reach out to other teachers to get them involved in the program.

### *Counselors*

Counselors must serve as "recruiters" for the Tech Prep program. Because counselors control the enrollment in classes, they must support the curriculum changes being made. Counselors also can provide some career development to students; however, they should not be responsible for an entire career development program for Tech Prep. A career development program requires involvement of the entire staff, not just the counselors.

## **Postsecondary Roles**

### *President/Vice President*

The president or vice president (depending on the size of the school) should provide visibility for the program at the postsecondary level as well as to the board of trustees and the community. Involvement at this level is often perceived as a sign of the total commitment of an institution.

### *Dean of Instruction*

The dean of instruction (again depending on the size of the school) should serve on the steering committee (chapter 3) and provide direction to the program. This person might serve as the force behind the changes on the postsecondary level. There are many policy and procedural decisions to be made regarding such

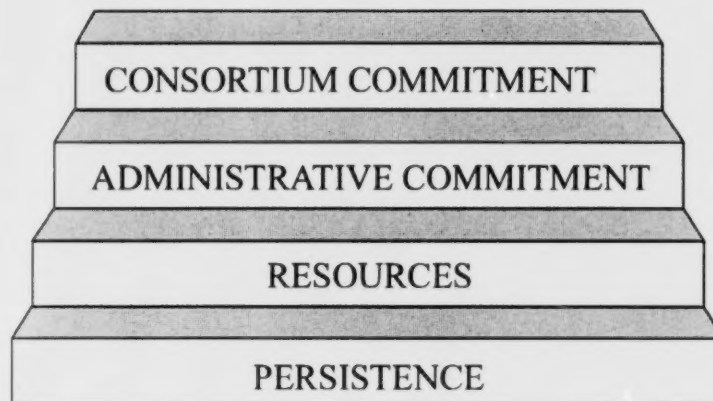
matters as the granting of college credit. It is helpful if this person is a champion for Tech Prep at the postsecondary level.

### *Teachers*

Postsecondary teachers might serve on articulation teams or curriculum integration teams (chapter 5). It is helpful if these teachers reach out to secondary school teachers to build a bridge across the institutions.

Use *The Essential Roles Checklist* below to determine how well your consortium is moving along.

1. Does the consortium have a director/coordinator?
2. Is the director/coordinator acting as an organizer of the consortium activities?
3. Is there someone in a district-level position creating visibility for Tech Prep?
4. Is there administrative leadership for Tech Prep in each high school?
5. Is there someone at the postsecondary level (other than the Tech Prep director) creating visibility for Tech Prep?
6. Is there someone handling the policy/procedural issues at the postsecondary level (other than the Tech Prep director)?



#### CONSORTIUM COMMITMENT

All consortium members must be actively committed to building a Tech Prep program. *Commitment is important to making the Tech Prep program work.*

#### ADMINISTRATIVE COMMITMENT

*The commitment to a Tech Prep program at the administrative level is vital to building an effective program. Faculty and staff members will not be able to make the changes required by the program if administrators and board members are not solidly behind the changes.*

#### RESOURCES

*Several types of resources will be needed to implement a Tech Prep program. These resources include: planning time, funding to support equipment needs, inservice programs, and time for faculty to work on curriculum.*

#### PERSISTENCE

*The Tech Prep program will not appear overnight; in fact, if it does, you should be suspicious. Typically, faculty members and counselors must first believe that change is needed. Changes made to implement a Tech Prep program are complex and cannot be carried out all at once. Identify the steps to be accomplished and focus on a few steps at a time. Once the first few steps have been accomplished, you can carve out the next task.*

**Chart 2.2.** What Does it Take to Make Tech Prep Work?

# *Creating the Tech Prep Consortium*

## **What Is a Tech Prep Consortium?**

In general, a consortium is a group of individuals joined together in partnership to accomplish a specific task. A Tech Prep consortium is a group of schools brought together to develop and implement a Tech Prep program. The very nature of Tech Prep requires that a consortium be created to develop the program. Because the program joins high schools with postsecondary schools, it is impossible to create a Tech Prep program without at least one high school and one postsecondary school (community college, technical school, college, or university).

The primary members of a Tech Prep consortium are schools, however, some Tech Prep programs also seek to involve businesses at an integral level. If this is part of the goal for your Tech Prep program, you may want to consider making some area businesses members of your consortium.

## **The Functions of a Tech Prep Consortium**

A consortium can perform many different functions for its members. Specific functions can and should be defined locally to fit the needs of each consortium. We recommend that you clearly identify the

### ***Why Is a Consortium Important in Tech Prep?***

***A Tech Prep program involves both high school (secondary) and college (postsecondary) education, so it is impossible to develop a Tech Prep program without a consortium. The more schools you involve in the consortium, the greater the potential for interaction among teachers, staff members, and administrators.***

functions your consortium will perform. This prevents any misunderstandings about the role of the consortium staff. Below are examples of functions typically performed by the Tech Prep consortium.

1. Provide linkages among consortium members.
2. Provide in-service programs to consortium members.
3. Identify tomorrow's career opportunities.
4. Structure career clusters.
5. Assist schools in producing promotional messages.

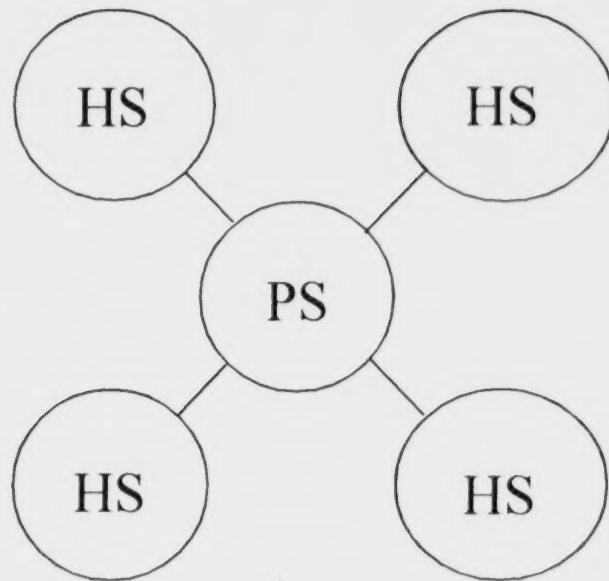
### **Provide Linkages Among Consortium Members**

There are two important components involved in providing linkages. The first is the set of linkages between each of the high schools and the postsecondary institution (see Chart 3.1). Each high school will need to have a working relationship with the postsecondary institution in order to build a smooth transition from high school to college.

The second link should be among the different high schools in the consortium (see Chart 3.2). One of the greatest advantages of working in a consortium is the opportunity to collaborate with teachers, counselors, and administrators from other schools. Having the opportunity to see what other teachers are doing with similar classes can be valuable in making changes in our own classes. Educators at all levels are isolated from one another. The consortium offers an opportunity to interact and exchange ideas in a nonthreatening environment.

### **Provide In-Service Programs to Consortium Members**

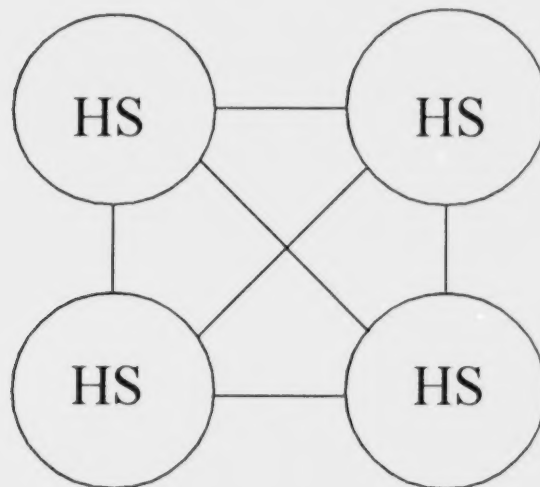
The consortium staff can provide some of the in-service programs that will be needed to get the program started. Typically, the



HS = High School

PS = Postsecondary

Chart 3.1.



HS = High School

Chart 3.2.

introductory programs on Tech Prep include topics such as What is Tech Prep?, Why is Tech Prep needed?, and What are the components of a Tech Prep program? All of these topics should be within the consortium director's knowledge base and ability. Additional in-service programs can be arranged by the consortium by hiring consultants to provide programs in needed topic areas.

### **Identify Tomorrow's Career Opportunities**

The consortium staff should have access to current labor market information. The U.S. Department of Labor publishes occupational projections as well as a journal titled *Occupational Outlook Quarterly*. It is important for members of the consortium to understand what is happening in today's employment marketplace. The consortium should provide the information to teachers, counselors, parents, students, and business and community members. The more your consortium and community members know about the changing labor market, the more effective the program will be.

### **Structure the Career Clusters**

The consortium may also determine which career clusters become a part of the program. A career cluster is a group of careers or occupations for which training is available at the postsecondary level. The careers are related to the main cluster title, though not necessarily to one another. Examples of career clusters include:

#### **Engineering Technology Cluster**

- Drafting Technology
- Electronics Technology
- Civil Engineering Technology
- Communications Technology

#### **Industrial Technology Cluster**

- Automotive Technology
- Metal Fabrication
- Railroad Operations
- Heating, Ventilation, and Air Conditioning

#### **Health Technology Cluster**

- Radiologic Technology
- Dental Hygiene
- Emergency Medical Science
- Nursing
- Respiratory Care

**Human Services Cluster**

Fire Science  
Criminal Justice  
Cosmetology

**Information Technology Cluster**

Data Processing  
Commercial Art

**Business Technology Cluster**

Office Systems Technology  
Accounting  
Marketing/Management  
Paralegal  
Tele-Service

**Assist Schools in Producing Promotional Messages**

Local schools may not have the resources to produce promotional materials for the program. A consortium can create a few promotional pieces that all schools can use and some pieces that can be customized for local schools. For example, a videotape, radio spots, and media events are all products the consortium might consider creating for local schools. Individual schools may be able to produce their own press releases and articles for local newspapers and magazines.

**Forming a Tech Prep Consortium**

Almost any group of schools can form a consortium. The minimum requirements for a Tech Prep consortium are one secondary and one postsecondary school. Here are a few simple steps which can be followed to set up your consortium. As you work through these steps, remember that your consortium should fit your local needs.

1. Assess interest in forming a Tech Prep consortium.
2. Create the consortium.

**Assess Interest in Forming a Tech Prep Consortium**

The first meeting held should be attended by the chief school officer from each institution. The superintendent is the secondary school representative who usually participates at this first meeting. The president or vice president for academic affairs is often the

postsecondary school representative. During this first meeting, you should create a basic understanding of what a Tech Prep program is, what a Tech Prep consortium is, and how the consortium can function, as well as determining who is interested in creating the consortium.

At the conclusion of the first meeting, it should be clear which parties are interested in participating in developing the program. Once you know who is interested in participating in the Tech Prep consortium, you can conduct a second meeting in which you work through the steps of creating the consortium.

### **Create the Consortium**

Creating the consortium involves establishing some organizational rules and expectations. The second meeting should include the same chief school officers who attended the first meeting and should add another key person from each institution. Usually this second person is the one who ultimately will be responsible for implementing the program in the school.

This second meeting should cover the following topics:

1. Identify conditions for consortium membership.
2. Identify the functions the consortium will serve.
3. Form a steering committee.
4. Identify sources of funding.
5. Develop a formal statement of agreement.

#### *Identify Conditions for Consortium Membership*

Identifying conditions for consortium membership is a process of creating minimum expectations for consortium members. Consortia can be built as tight or relaxed organizations. It is important that you design the consortium as it will be most effective for your local situation. It is helpful, however, to lay out expectations of each consortium member before entering into the project. This way, members know the tasks to be accomplished. Some of the issues you may want to address are identified below.

***Minimum Length of Commitment for Members.*** Will each member be required to make a minimum time commitment to the project? Typically, significant change takes a minimum of 5 years to occur. You may want to consider asking members to agree to a minimum of 3 years in the original agreement.

***Minimum Activities for Members.*** You may want to set minimum activities for members. For example, members should develop at

least one career cluster, participate in consortiumwide in-service programs, and provide district representation to consortium work teams.

**Local Funding Commitment.** Will each member be required to make some sort of financial commitment to the project? This may take the form of funds for equipment, or it may be in curriculum development in-service time, substitute days, or overload hours.

#### *Identify the Functions the Consortium Will Serve for Its Members*

Identifying the consortium functions will help members understand the role each member plays in the development of the program. The functions discussed in the previous section can be used as a guide to select the functions your consortium will provide.

#### *Form a Steering Committee*

The next step is to form one main steering committee. The purpose of this committee is to provide the vision/mission for Tech Prep and to organize the work involved in creating the Tech Prep program. Each consortium member should designate at least one person to serve on the steering committee.

Hull and Parnell (1991) suggest creating two different committees for this function. The leadership and implementation committees (described below) could be combined into one group that makes the final decisions and serves as the "workhorse" for the project. It is not important how many committees you create for the steering of the project, as long as the tasks get accomplished.

**Leadership Committee.** The primary purpose of this committee is to commit the institutions in the consortium to a Tech Prep program and make that commitment visible. The committee has overall responsibility for the program and makes final decisions.

**Implementation Committee.** This committee has been referred to as the "workhorse" of all the committees. It is responsible for making the major decisions that go into formal agreements and for establishing the other committees that report back to it.

We suggest that the following kinds of people might serve on the steering committee(s): the director of secondary education, technical managers, the principal or vice principal, human relations directors, the associate superintendent, program directors, department chairpersons, and deans/assistant deans.

The steering committee might serve the following specific functions:

1. Create and appoint any additional committees/teams to work on the Tech Prep project.
2. Address and finalize consortiumwide issues as they arise in curriculum development, promotion/information, evaluation/assessment, and business and industry involvement.
3. Be responsible for Tech Prep within each school or organization.

The steering committee does not need to have specific knowledge within all three areas identified above. The committee must call on specific people to meet and make recommendations in each of the areas listed above. The steering committee's role is to finalize decisions, not necessarily to do all the work involved in investigating the problems and seeking solutions. In Tech Prep, value lies in tapping expertise outside the steering committee and consortium staff. The steering committee's role is to finalize decisions. It is not responsible for all the work involved in creating a Tech Prep program.

#### *Identify Sources of Funding*

Another question consortium members should discuss is how the consortium will be funded. There are several sources of funding available for Tech Prep programs. Some of these sources are identified below.

**State Funding.** Several states have appropriated funds to support the development of Tech Prep programs. We recommend that you contact your state education department or agency for additional information on this source of funding.

**Federal Funding.** Although federal legislation is currently in flux, there are some sources for federal funding. The current Carl Perkins Vocational and Applied Technology Education Act is the major source of federal funding for Tech Prep. This legislation contains two sources of support for Tech Prep. You should look at using program improvement money from Title II or the competitive dollars from Title III. You should contact your state department of education or the agency in your state that handles Carl Perkins funding.

The School to Work Opportunities Act also supports the kinds of activities included in a Tech Prep program. The school-to-work emphasis, however, is an even more systemic change than Tech Prep. The new block grant being discussed now will support the same kinds of activities that Tech Prep supports. Specifics are not available, as the legislation is not final.

**Local Funding.** One should never overlook the obvious. Schools already allocate funds for curriculum development and in-service

programs. If Tech Prep is a district priority, local money can be reallocated within the district.

How much money does it take to implement Tech Prep? We are confident that there is no one set amount of money it takes to implement Tech Prep. We suspect that it takes as much money as is available in the budget! The minimum expenditure we recommend is the hiring of a person (director or coordinator) who can focus efforts on the project. When the project is assigned to someone who already has a full-time job, it often gets lost in the shuffle.

There may be some equipment needed to implement applied teaching strategies in the classroom; however, we see no need for expensive purchases, especially early in the development of the program. The kinds of manipulatives needed for applied teaching strategies often can be purchased from local department stores. We are always encouraged by teachers who find innovative ways to teach in an applied fashion for very little money. If a school decides to implement an expensive program, this decision should be made carefully and over a reasonable amount of time. Purchases of pre-packaged curriculum and equipment should be made with care.

In addition to determining the sources of funding, it is important to agree on the activities to be funded. The following is a list of activities typically found within a Tech Prep program budget.

- Personnel
  - Professional staff: Tech Prep coordinator/director
  - Support staff: secretary
- In-Service Needs
  - Travel
  - Consultants
  - Workshop fees
- Curriculum Development
  - Curriculum materials
  - Substitute pay/stipends
- Instructional Equipment
  - Lab materials
- Promotional Items (video, brochures, newsletters, etc.)

#### *Develop a Formal Statement of Agreement*

Developing a written agreement is a way for the consortium members to solidify the consortium as an organization. An agreement can be formal and detailed or informal and general. It should be signed by all consortium members. It can be used to promote the project and the commitment of the members.

This is an example of an agreement presented by Hull and Parnell (1991). Unlike the one we used in our own consortium, this one is relatively informal and general.

### Executive Articulation Agreement

The institutions listed below are committed to developing and implementing a 2 + 2 secondary/postsecondary Tech Prep program in \_\_\_\_\_ Technology. The curriculum to be installed will allow a high school student to enroll in classes at the high school that qualify for postsecondary credit after the student has been graduated. The program is to begin by \_\_\_\_\_.

\_\_\_\_\_  
CEO, Secondary School

\_\_\_\_\_  
CEO, Postsecondary Institution

\_\_\_\_\_  
CEO, Secondary School

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The following is an example of a written agreement we used in our own consortium.

**Agreement of Participation for the  
Tech Prep Associate Degree Consortium of  
Johnson/Douglas Counties**

We, the undersigned, agree to participate in the Tech Prep Associate Degree Consortium of Johnson/Douglas Counties from July \_\_\_\_ to July \_\_\_\_.

The objectives listed below are the minimum activities for a member of the consortium.

1. Send representation to consortiumwide committees.

Each participating member agrees to develop promotional materials and evaluation strategies, provide input from business/industry, develop curriculum, and perform other related activities. Tech Prep funds shall be used to provide substitutes and stipends for staff.

2. Appoint and support the efforts of a local Tech Prep action team.

Each participating member agrees to establish and support a local action team in the design of a sequence of courses that fulfills the core proficiencies and one of the Tech Prep clusters.

3. Promote the concept of Tech Prep within the local school and community.

Each participating member agrees to promote the idea of Tech Prep as a viable option for students.

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### The Consortium Worksheet

Use this worksheet to form your consortium.

1. List Tech Prep consortium members.

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2. Identify any conditions for consortium membership.

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3. Identify the funding source(s) for the consortium and the activities to be funded.

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### The Consortium Worksheet, Continued

4. Identify the functions the consortium will serve.

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5. Identify items to be included in the formal agreement.

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6. List the members of the Tech Prep Consortium Steering Committee.

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## References

- Hull, Dan, & Parnell, Dale. (1991). *Tech Prep associate degree: A win\win experience*. Waco, TX: CORD Communications.
- Occupational Outlook Quarterly. Bureau of Labor Statistics.

## *Getting Started*

Once the consortium has been formed and the steering committee is in place, the Tech Prep program must be defined. The consortium members must come to consensus regarding the purpose of the program and the specific parameters to be used. Defining the Tech Prep program is the first task for the steering committee to tackle. This can be accomplished by following the steps listed below.

1. Create vision and mission statements.
2. Set parameters for the program.

The first task for the steering committee is to establish a vision and mission for the project. Here are some suggestions for creating the vision and mission:

1. Devote at least one full meeting to developing the vision/mission.
2. Have an outside facilitator run the vision/mission meeting.
3. If a member of the consortium runs the meeting, this person should act as a facilitator and not a participant.

**Tech Prep Associate Degree Consortium  
of Johnson/Douglas Counties**

**VISION STATEMENT**

To implement a nationally recognized Tech Prep program that joins business and education to prepare all students for a rapidly changing workforce through enhancing technical, communication and collaborative skills.

**MISSION STATEMENT**

To develop and offer **programs of study** in expanding career fields using **innovative teaching methods** that engage and empower students by bringing the workplace and the classroom together.

**Programs of study**-sequences of courses and learning opportunities offered in high school and college.

**Innovative teaching methods**-new, nontraditional, and creative teaching procedures that apply learning, integrate subjects and disciplines, and tap a variety of learning styles.

Chart 4.1.

## Creating Vision and Mission Statements

### What Is a Vision Statement?

A vision statement is a representation of how the program is viewed. The vision statement should be a lofty statement that reaches into the future. The statement will be used to guide the sights of consortium members. Many organizational consultants are available to assist your consortium with writing the vision statement. The consortium should not hesitate to revisit the vision statement and rewrite it now and then. The vision must always be current.

### What Is a Mission Statement?

The mission statement describes how the vision will be accomplished. The mission statement should indicate the activities that will take place in order to achieve the vision. Unlike the vision, a mission statement is not lofty but very practical. The mission statement should serve as the overall goal for your Tech Prep program. Chart 4.1 is an example of a vision and mission statement used by

the Tech Prep Associate Degree Consortium of Johnson/Douglas Counties.

## **Setting Parameters for the Program**

### **Selecting a Tech Prep Model**

Several Tech Prep models are available for consideration. Each model lays out a slightly different grade-level structure. Here are some examples of Tech Prep models.

#### *2 + 2 Tech Prep Program*

A 2 + 2 Tech Prep program includes the last 2 years of high school (Grades 11 and 12) and the first 2 years of postsecondary school (Grades 13 and 14). This model provides for students to earn an associate degree or certificate and lays out a sequence of courses for these 4 years.

#### *4 + 2 Tech Prep Program*

A 4 + 2 Tech Prep program begins in the 9th grade of high school and extends through the first 2 years of postsecondary school. This program also provides for students to earn an associate degree or certificate. The course sequence for this program covers 6 years.

#### *2 + 2 + 2 Tech Prep Program*

A 2 + 2 + 2 Tech Prep program typically begins in the junior year of high school and includes 2 years of postsecondary school that provide an associate degree, plus an additional 2 years at a 4 year college to complete a bachelor's degree. This program lays out a 6 year sequence of courses culminating with a bachelor's degree.

#### *4 + 2 + 2 Tech Prep Program*

A 4 + 2 + 2 Tech Prep program begins in the 9th grade and takes students through the associate degree or certificate and the bachelor's degree. This program lays out an 8 year sequence of courses.

### **Time-Shortened vs. Advanced Skill Programs**

Another important consideration in building your program involves the selection of a time-shortened or an advanced skill

*A word of caution is advised in naming a number of years to complete an associate degree program. Many associate degree programs cannot be completed in 2 years. A word of caution is also advised when building a Tech Prep program into the bachelor degree level. Many associate degrees in technical fields do not allow smooth transitions into bachelor's degree programs. We suggest that you discuss specific degree programs with representatives from 4 year colleges and universities before including this feature as a part of your Tech Prep program.*

program. It is important to make this decision early in the planning stage of your program so that subsequent decisions are appropriate.

A time-shortened program allows students to obtain advanced standing credit for postsecondary work while they are still in high school. The advanced credit they receive gives them a head start on the postsecondary curriculum and allows completion of the degree sooner. In this scenario, the postsecondary institution does not change its degree programs at all.

An advanced skill program also allows high school students to receive advanced standing credit for work completed in high school. This kind of program, however, usually adds additional coursework on the upper end of the degree program so that students leave with more advanced skills. For example, an introduction to drafting course may provide high school students with college credit; however, the credits will satisfy a prerequisite to the degree program rather than a part of the degree program itself. The postsecondary program can take students farther by adding additional skills training.

**Tech Prep Definition Worksheet**

1. Create a vision for the Tech Prep program.

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2. Create a mission statement for the Tech Prep program.

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3. What grade levels will your Tech Prep program include?

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4. Will this be a time-shortened or an advanced skill program?

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## *Organizing the Teams*

**W**e recommend organizing the Tech Prep program on three levels: consortium, local school district, and postsecondary school. Each of these levels will have its own set of tasks to perform.

### **Organizing the Consortium**

Work teams should be established by the steering committee to facilitate the many activities required to plan and develop a Tech Prep program. Work teams are responsible for handling issues that relate to all consortium members.

### **Creating Work Teams**

There are several main tasks involved in the development and implementation of a Tech Prep program. Some common consortium work teams include curriculum, evaluation, promotion, and business and industry (see Chart 5.1). The specific function of each of these work teams must be defined by the steering committee.

The steering committee is responsible for appointing the work teams. In addition to establishing the membership, the steering committee should define the specific responsibilities of each consortium work team. This will help the team to focus its efforts and

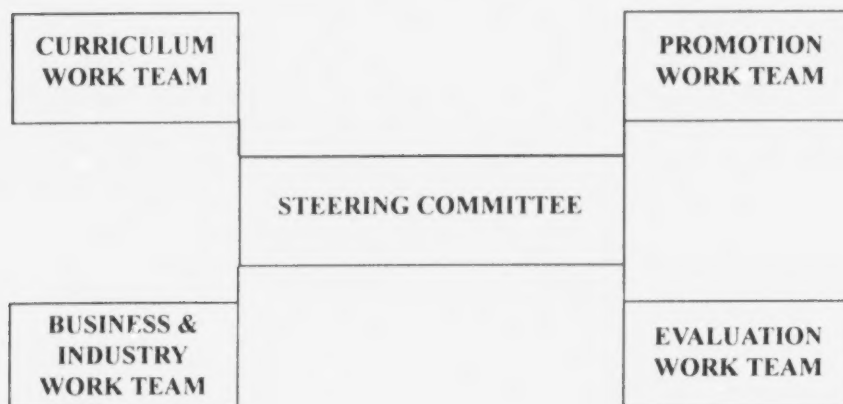


Chart 5.1.

ensure that the team accomplishes what needs to be done. Use the Consortium Work Team Worksheet (page 49) and the sample letter of invitation to serve on a Tech Prep work team (page 50) to help set up the teams.

The steering committee should remember that the work teams are consortium-level teams. As consortium-level teams, their efforts should be focused on issues that affect all members of the consortium. The work teams cannot make decisions for individual schools. Another consideration to keep in mind is that all consortium members should be represented on each of the work teams (unless this creates a very large team). Finally, a chairperson (other than the Tech Prep coordinator) should be appointed for each work team.

### The Curriculum Work Team

This work team deals with curriculum policies for the consortium. From our perspective, the curriculum team responds to the following kinds of questions:

- What are the core proficiencies for Tech Prep?
- What are the characteristics of the Tech Prep curriculum?
- What in-service programs must be provided for teachers to shift their teaching strategies?

The team should have the option of creating ad hoc groups to solve specific problems or make recommendations. For example, an ad hoc group might be created to define the core proficiencies for Tech Prep students or build a plan to assist teachers in integrating academic and technical curriculum.

*Who Should Serve on the Curriculum Work Team?*

The curriculum work team should comprise representatives from each consortium member. It is best to have district-level representation from the secondary schools and administrative-level personnel from the postsecondary schools. Placing only teachers on this work team often does not provide the clout needed to get the job done.

**The Promotion Work Team**

This work team publicizes the program. If your consortium is large and covers a wide variety of schools (e.g., rural, suburban, large, and small), this team can handle promotion by creating a few major pieces for all consortium members to use. Individual schools can do local promotion for their own initiatives.

*Who Should Serve on the Promotion Work Team?*

Members of the promotion work team should be from all consortium members. Information directors, media contact people, and other promotion professionals employed by the schools are essential members. Members of the local media also are excellent potential members of this team.

**The Evaluation Work Team**

This work team assesses the effectiveness of the Tech Prep program. It is important to know if the program is effective. The team must determine what data elements will be collected and analyzed, as well as what kind of conclusions you want to make about the Tech Prep program.

*Who Should Serve on the Evaluation Work Team?*

Members of the evaluation team should represent all consortium members. You will need people who have knowledge and experience in evaluating programs. It is also important to have people from each school district who handle student data/information.

**The Business and Industry Involvement Work Team**

This team can plan specific activities to bridge the gap between the skills used on the job and the skills taught within the classroom. Skills such as critical thinking, teamwork, and communication are essential for employees to have and sometimes difficult for teachers

to teach within the classroom. Activities such as internships, mentorships, and days on the job can be effective tools in getting the Tech Prep student closer to employment.

*Who Should Serve on the Business  
and Industry Involvement Work Team?*

Ideally, this team should be composed primarily of business and industry representatives. Some education personnel are important; however, the driving force for a group like this should be the business community.

**When Should the Work Teams Be Created?**

We recommend creating the curriculum work team before any of the other teams. This work team must establish the curriculum foundation before other tasks can take place.

When creating a promotion work team, you should be sure you have a program to promote before creating a need in the minds of parents and students.

The evaluation work team can be created early in the project so that data collection procedures are ready when students begin to enroll.

The business and industry involvement work team should be created early in the project. This team can play a crucial role in the development of the program.

### Consortium Work Team Worksheet

\_\_\_\_\_  
Name of Work Team

1. List the members below.

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2. Identify the goals of the work team.

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Dr. Christine Stone  
Curriculum Director  
Unified School District 111  
5647 Pearle Avenue  
Overland Park, Kansas 66666

July 1, 1994

Dear Dr. Stone,

The Tech Prep Consortium of Johnson County is building a program to help students prepare for their future. We are building sequences of courses for high school students who want to pursue a two-year degree. We are creating a curriculum work team for the project and would appreciate having you as a member of this team.

The team will handle the major curriculum issues for the schools in the project. The team will be establishing core competencies for students and identifying the curriculum changes to be made within courses. The team will also be designing and implementing an inservice plan to help teachers make the appropriate changes. The team will meet approximately once a month for three hours during this academic year. Specific dates will be set during the first meeting.

The first meeting of the curriculum work team will be on August 23, 1994, at Johnson County Community College. The meeting will begin at 9:00 A.M. in the Cultural Education Center, room 324. Please bring your calendar so we can set subsequent meeting dates. We have enclosed an agenda and a map for your convenience.

If you will be unable to join us on this work team or are unable to make the meeting on August 23, please let us know by contacting the Tech Prep project office at 469-8500, ext. 4143. Thank you for your time and attention.

Warmest regards,

**Figure 5.1.** Sample Letter of Invitation to Serve on a Tech Prep Work Team



Chart 5.2.

### Organizing the Local School District

We have found that it is helpful to have two kinds of Tech Prep teams at the secondary level for implementing the program: an action team and building teams. The local school district is responsible for creating the action and building teams.

Chart 5.2 is a diagram of how a school district with three high schools might be organized for Tech Prep using an action team and building teams.

The following section discusses each of these teams in detail.

#### Tech Prep Action Teams

The first team we recommend creating is an action team. The action team provides leadership and guides the overall development of the program within the local school district. The district representative to the steering committee should work with the principals to create the action team. Typically, either the steering committee member or a district administrator serves as chairperson of the action team.

The action team should represent all the high schools in the district as well as district-level administrators. High school representatives might include principals, lead teachers, and counselors. District-level representatives might include the superintendent, assistant superintendent, curriculum director, or director of secondary education. A business representative and a board of education member are excellent additions to this group.

The following is a typical list of responsibilities for a Tech Prep action team.

1. Set a district timetable and plan for implementation.
2. Plan in-service activities for faculty and staff.
3. Project budget needs.
4. Promote the Tech Prep program within the community and the school system.
5. Develop/oversee course sequencing and other curriculum changes as necessary.
6. Prepare and present recommendations to the Board of Education.
7. Build agreements with postsecondary schools.
8. Monitor the effectiveness of the Tech Prep program.
9. Involve business and industry representatives in the program.
10. Identify the career clusters to be developed by the district.

Use the worksheet and the sample memorandum of invitation on the next two pages to help create the action team.

## Action Team Worksheet

1. Identify the people who will serve on the Action Team.

Name \_\_\_\_\_

### Position

Building

Phone

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

**MEMORANDUM**

TO: Mr. Louis  
FROM: Dr. Grant  
DATE: August 12, 1994  
SUBJECT: Tech Prep Action Team

As you know, our district is involved in the Tech Prep Consortium of Johnson County. We are creating a Tech Prep Action Team for our district and would like to have you as a member of this team. The team will handle district-level decisions about Tech Prep in Olathe.

We will need to meet monthly for the first year. The first meeting has been scheduled for September 16, 1994, at 1:30 P.M. in the conference room at the education center. Please let me know if you will be able to join us on the Tech Prep Action Team.

The agenda for the first meeting is listed below:

- 1:30 P.M. Call to order
1. Introduction of members
  2. Review of Tech Prep Consortium
  3. Goals of the Tech Prep Action Team
  4. Set meeting schedule for the year
  5. Background on Tech Prep Adjournment

**Figure 5.2.** Sample Memorandum of Invitation to Serve on a Tech Prep Action Team

**MEMORANDUM**

TO: Ms. Steward  
FROM: Dr. Bryant  
DATE: September 5, 1994  
SUBJECT: Tech Prep Building Team

As you know, our district is involved in the Tech Prep Consortium of Johnson County. We are creating a Tech Prep Building Team for our high school and would like to have you as a member of this team. The team will focus on how Tech Prep will be implemented in our building.

The first meeting has been scheduled for October 4, 1994, at 10:00 A.M. in the library media room. Please let me know if you will be unable to join us for this meeting.

The agenda for the first meeting is listed below:

- 10:00 A.M. Call to order
1. Review of Tech Prep Consortium
  2. Goals of the Tech Prep Building Team
  3. Prioritize goals and assign subteams

**Figure 5.3.** Sample Memorandum of Invitation to Serve on a Tech Prep Building Team

### **Tech Prep Building Teams**

The second team we recommend creating is a building team within each high school. Tech Prep building teams are responsible for handling implementation issues at the building level. The team should be appointed by the steering committee representative and the principals. This team is best chaired by the principal or other administrator at the building level.

The building team is best composed of the principal, at least one counselor, and at least four teachers from various content areas (academic and technical). A business representative and a board member are excellent additions to this team. Another consideration is to keep common members between the action team and the building teams. You want communication to flow smoothly among these teams.

The following is a typical list of responsibilities for a building team.

1. Assist in developing the curriculum sequence.
2. Promote the program within the high school.
3. Identify and enroll Tech Prep students.
4. Meet with postsecondary school representatives to articulate curriculum.
5. Design and produce recruitment materials for students.
6. Make curriculum changes and work with other faculty and staff toward curriculum changes.

Additional responsibilities should be identified in response to local needs.

The building team will consist of a small portion of the high school staff. It is important that all staff members at least understand Tech Prep. Ideally, you want as many staff members as possible to be involved. The more involvement you have at the building level, the more effective the program will be.

Use the worksheet (page 52) and the sample memorandum of invitation (page 50) to help create the building team.

**Building Team Worksheet**

1. Identify the people who will serve on the Building Teams.

\_\_\_\_\_  
Building Name

Name

Position

Phone

|       |       |       |
|-------|-------|-------|
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| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

\_\_\_\_\_  
Building Name

Name

Position

Phone

|       |       |       |
|-------|-------|-------|
| _____ | _____ | _____ |
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| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

## Organizing the Postsecondary School

We recommend creating two kinds of teams at the postsecondary level. The first kind of team focuses attention on articulation agreements, and the second focuses on curriculum integration and application.

The articulation teams at the postsecondary school are responsible for building a nonduplicative course of study within the career programs. Each career program will need an articulation team. Responsibilities of the articulation team are identified below.

1. Compile current competency lists for coursework offered in the career program.
2. Share competencies with secondary teachers who teach related courses.
3. Create a course sequence within the program from secondary to postsecondary that eliminates duplication of coursework.
4. Develop a signed agreement that identifies the nonduplicative sequence of courses and recommended electives.

Each articulation team should be composed of a program director and several faculty members. We recommend that a team chairperson be appointed to oversee and coordinate the activities of the team. The process of creating an articulation agreement will take at least two meetings.

### Articulation Team Worksheet

\_\_\_\_\_  
Name of Career Program

Members of Articulation Team:

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Goals of the Articulation Team:

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### Curriculum Integration Teams

Curriculum integration teams are responsible for promoting changes in teaching strategies at the college or university. These teams should be composed of faculty from a variety of career programs and academic disciplines. There should be a chairperson responsible for facilitating the meetings. The responsibilities of each team may vary greatly. Below are two possible responsibilities for these teams. It is important for these teams to develop projects that are most suited to the students within the local programs.

*Develop Opportunities for Integrating Curriculum Across Disciplines.* This may include team teaching strategies between and among English, communication, history, psychology, sociology, economics, and other disciplines.

*Create Opportunities for Integrating Career Development into Classrooms.* This activity may include faculty from career programs as well as other disciplines. Many faculty members are not aware of how their disciplines are used within various careers and employment opportunities. Faculty who teach within career programs often can provide the application that allows students to see the usefulness of what they are learning.

### Curriculum Integration Team Worksheet

Members of Curriculum Integration Team:

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Goals of the Team:

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## *Conducting In-Services*

**M**any people will be involved in the development of the Tech Prep program. We suggest you first provide in-service programs for participants so that a common understanding can be created.

### **Who Needs In-Service Programs?**

Anyone who will play a key role in the development of the program should be trained first. Additional participants will also need in-service training; however, we recommend focusing first on the members of the steering committee, the work team members, the action and building team members, and the articulation and curriculum integration teams. After these people have received an orientation, you should turn your attention to additional groups.

First, provide orientation to the steering committee, consortium work teams, school district teams, and postsecondary teams. Once the key players have received an orientation to Tech Prep, you should turn your attention to such groups as faculty and staff at all consortium schools, community members, school boards, and business and industry personnel.

## **In-Service Topics**

There are two specific topics we believe all key players must understand before they can be effective members of the project. These components are:

1. The meaning of a Tech Prep Program.
2. The role each of them is being asked to play.

### **Understanding the Tech Prep Program**

It is important that the work team members have a solid understanding of the program and its specific goals. We suggest providing in-service programs and/or workshops on several topics to help the members of work teams understand the project.

To provide a complete understanding of Tech Prep, we suggest including all the following topics within the first in-service program:

- What is a Tech Prep program?
- Why is a Tech Prep program needed?
- What is a Tech Prep consortium?
- What kinds of changes will a Tech Prep program require?

### **Understanding One's Role in the Tech Prep Program**

The key players must also understand their own roles in the Tech Prep Program. All work team members must understand what is expected of them. This includes knowing:

- How often they will be meeting
- How much time will be needed for meetings and for work outside meetings
- How long the team will exist
- What the team's specific responsibilities will be

After an in-service program has been provided for the key players, attention can be turned to additional groups. Some groups can be addressed by the consortium staff; however, it will not be possible for the consortium staff to provide all in-service training. Each consortium member must identify specific local audiences that should be informed and make arrangements to provide the appropriate in-service training. We make the following suggestions for local in-service programs:

*District Level*

- The Board of Education should receive a full explanation and regular updates of the program and changes being made for the Tech Prep program
- Advisory groups that work with the school system will need to know about Tech Prep and the changes being made

*High School Level*

- Local parent groups should be informed about Tech Prep and the changes it will bring to the school
- All faculty and staff should be aware of Tech Prep and the changes it will bring

*Postsecondary Level*

- The Board of Education must be aware of Tech Prep and the changes it will bring to the college
- As many faculty and staff at the college as possible should be informed about Tech Prep and how it will affect students coming into the college
- Advisory councils should be aware of and involved in Tech Prep

**Basic Presentations**

We suggest creating three different basic presentations on Tech Prep. These can be used on different occasions as necessary. The presentation you use will depend on the audience you are addressing.

**Model 1**

This is a 15-minute presentation designed to familiarize your audience with the basics of Tech Prep. Typically, this presentation will contain one or two transparencies from the changing workplace section, one or two (if any) from the education section, and two or three from the Tech Prep definition section. You may use this presentation for community and other related audiences. This is a short presentation that contains the bare minimum.

**Model 2**

This is a 30- or 45-minute presentation designed for audiences who need to know more than the basics of Tech Prep. You should

add transparencies from the section that is most appropriate for your audience. For example, boards of education may need more information from the transparencies on the Tech Prep definition section than from the education section. This presentation should contain more specific information for an audience that is more highly motivated.

### **Model 3**

This is a presentation of an hour or longer designed for audiences who are directly related to the Tech Prep project. Typically, this presentation is given to teachers, counselors, and other education professionals. Transparencies used should reflect each of the sections equally (workplace, education, and Tech Prep).

## **Transparency Masters**

We have provided some transparency masters for your convenience. They are designed to address three main topics:

### **The Changing Workforce**

- Our future depends upon a highly skilled workforce
- Technology has increased the skill levels required for workers
- Agriculture (plow to biotechnology)
- Manufacturing (assembly line to robotics)
- Information (typewriters to voice to print)
- Employment shift from manufacturing to service
- Trends of the future (a)
- Trends of the future (b)

### **Education Issues**

- The problem
- Education (K-16) must change
- 75% of high school graduates do not receive a 4 year degree
- What happens to high school graduates?
- The new basic skills
- SCANS three-part foundation
- SCANS Competencies

### **Tech Prep**

- What is Tech Prep?
- Who is Tech Prep for?
- Components of Tech Prep
- Functions of a Consortium

Course sequence

Course sequences built around career clusters

Three levels of proficiency

We recommend that you add transparencies that relate to your local project.

# *Transparency Masters*

## *The Changing Workforce*

**O**ur future depends upon  
a highly skilled workforce

**Technology has increased the  
skill levels required for workers**

**Agriculture has moved from the  
plow and the mule to genetically  
altering foods using biotechnology**

**Manufacturing has moved from  
assembly line workers to robots  
and technicians who maintain them**

**I**nformation processing has moved  
from manual typewriters and  
keypunch to voice-to-print technology  
and Personal Data Assistants (PDA)

**E**mployment has shifted  
from manufacturing to service.

## **T**rends of the Future

**60% of high school students will work in jobs  
that currently do not exist**

**90% of all jobs in the year 2000 will require  
knowledge of a computer**

**85% of future jobs will require skill training  
beyond high school**

**80% of future jobs will require some college  
but less than a 4 year degree**

83

87

## **T**trends of the Future

**The average adult changes jobs 7 times  
and changes careers 3 times  
over his or her work life**

**The new workforce will work  
predominantly in small companies  
(25 employees or less)**

**The workforce will be predominantly  
female, older, and multicultural**

## *Education Issues*

## **The Problem!**

- **Our education system was not designed to produce highly skilled workers.**
- **The system was designed for an economy based on unskilled labor.**

## **E**ducation (K-16) Must Change

- Since 1989, one-third of the jobs requiring a bachelor's degree have disappeared.
- By 2005, only 30% of jobs will require a bachelor's degree.
- 75% of the new jobs created in the next ten years will require some college but less than a four-year degree.

95

**75% of high school graduates  
do not receive a 4 year degree  
*yet***

**Our curriculum is designed  
for students bound for a  
4 year college degree**

## **W**hat Happens to High School Graduates?

|             |                                      |
|-------------|--------------------------------------|
| <b>1980</b> | <b>55% Entered college</b>           |
|             | <b>45% Did not enter college</b>     |
| <b>1982</b> | <b>31% Still enrolled in college</b> |
|             | <b>67% Not enrolled</b>              |
| <b>1987</b> | <b>24% Bachelor's degree</b>         |
|             | <b>8% Arts and sciences</b>          |
|             | <b>2% Graduate</b>                   |
|             | <b>3% Professional</b>               |
|             | <b>16% Professional fields</b>       |

99

# **The New Basic Skills**

- **Learning to learn**
- **Reading, Writing, Computation**
- **Listening and Oral Communication**
- **Creative Thinking/Problem Solving**

SOURCE: From *Workplace Basics: The Skills Employers Want*, Carnevale, Gainer, and Meltzer, © copyright 1988 by U.S. Department of Labor, Employment and Training Administration.

# **SCANS\***

## **Three-Part Foundation**

- **Basic Skills**
- **Thinking Skills**
- **Personal Qualities**

\*Secretary's Commission on Achieving Necessary Skills

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## Five SCANS\* Competencies

- Resources
- Interpersonal
- Information
- Systems
- Technology

\*Secretary's Commission on Achieving Necessary Skills

## *Tech Prep*

## **What Is Tech Prep?**

**A technical education program  
that begins in high school and  
culminates with an associate degree  
or 2 year certificate**

# **Who Is Tech Prep For?**

**Job Training → Employment**

**General Education → ???????????**

**College Preparation → 4 Year Degree**

110

## **Components of Tech Prep**

- 1. Course sequences**
- 2. Sequences built around career clusters**
- 3. Three proficiency levels**
- 4. Application-based teaching strategies**
- 5. Integration of disciplines and subjects**
- 6. Involvement of business and industry**

## **F**unctions of a Consortium

- 1. Provide linkages among members**
- 2. Provide in-service programs to consortium members**
- 3. Identify tomorrow's career opportunities**
- 4. Structure the career clusters**
- 5. Assist schools with promotion**

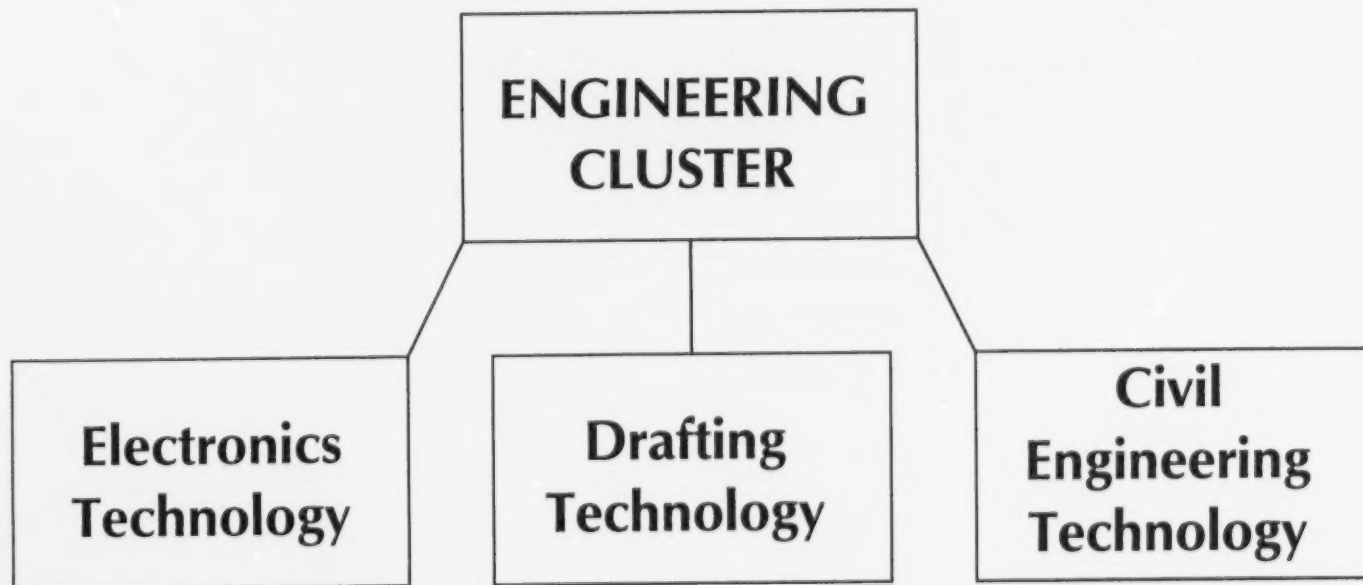
114

113

# Course Sequence

| Secondary |    |    |    | Postsecondary |    |
|-----------|----|----|----|---------------|----|
| 9         | 10 | 11 | 12 | 13            | 14 |

# Course Sequences Built Around Career Clusters



## **Three Levels of Proficiency**

**Specialty Proficiencies  
(Postsecondary)**

**Technical Proficiencies  
(High School and Technical School)**

**Core Proficiencies  
(High School)**

# *Modifying the Curriculum*

## **The Sequence of Courses**

A Tech Prep program presents a sequence of courses beginning in high school and culminating with an associate degree or 2 year certificate. This sequence of courses should do the following:

1. Replace the "general education" sequence of courses in high school.
2. Include courses that cover the core, technical, and specialty proficiencies.
3. Run parallel to the traditional "college bound" sequence of courses in high school.
4. Raise expectations for student performance.
5. Be an option for all students.
6. Provide advanced skills for program graduates.

There are three levels of proficiency within a Tech Prep program. The next section discusses the three proficiency levels.

Level 1: Core proficiencies (high school) of math, science, communication, and technology

Level 2: Technical proficiencies (high school and technical school)

Level 3: Specialty proficiencies (postsecondary)

### **Level 1: The Core Proficiencies**

Core proficiencies are the required skills in mathematics, science, communication, and technology for all Tech Prep students. The curriculum work team should identify the core proficiencies for the Tech Prep program. These proficiencies help schools to create a common set of basic requirements for Tech Prep students. Whenever many secondary schools are feeding students into the same postsecondary school, it is essential to have training to skills at approximately the same level. Assuming that the secondary school consortium members will make their own curriculum changes, it is essential to have those curriculum changes grounded in a set of core proficiencies. All schools address the core proficiencies; however, each one may do so in a different way.

The core proficiencies can be established by the curriculum work team or an ad hoc group created by the curriculum work team. Each consortium should establish the content areas that the core will touch. The set of core proficiencies for our consortium are contained in Appendix C.

### **Level 2: Technical Proficiencies**

Technical proficiencies are the introductory skills within a career cluster or program. They are also the technical skills necessary for entrance into and effective performance in the postsecondary career program.

### **Level 3: Specialty Proficiencies**

Specialty proficiencies are the skills required for successful employment within a specific occupation. The third level of proficiencies addressed by a Tech Prep program, these are taught at the postsecondary institution. Typically, these sequences of courses already are in place.

Articulation is the process of aligning the secondary and postsecondary curricula so that there is a sequenced, nonduplicated program of study. This may include awarding students advanced standing credit at the postsecondary school for the proficiencies they already can demonstrate. After a Tech Prep program is up and running, and when students entering the postsecondary degree programs are demonstrating the appropriate skills, the sequence of courses that encompasses the specialty proficiencies can be elevated. This will allow students to graduate from the degree program with a higher level of skills.

|                               | 9 | 10 | 11 | 12 | 13 | 14 |
|-------------------------------|---|----|----|----|----|----|
| ENGLISH                       |   |    |    |    |    |    |
| MATH                          |   |    |    |    |    |    |
| SCIENCE                       |   |    |    |    |    |    |
| HUMANITIES/<br>SOCIAL SCIENCE |   |    |    |    |    |    |
| OTHER<br>REQUIREMENTS         |   |    |    |    |    |    |
| TECHNOLOGY                    |   |    |    |    |    |    |
| TECHNOLOGY                    |   |    |    |    |    |    |

Chart 7.1.

### Creating the Sequence of Courses

Begin with a grid that identifies the year in school and the content areas covered. This form can be used to "plug in" the courses within the sequence. Chart 7.1 is a sample blank form.

**STEP 1:** Identify specific courses required for high school graduation. Place these courses on the grid.

**STEP 2:** Identify the courses that will address the core proficiencies designed by the curriculum work team. Place these on the grid in the appropriate squares.

**STEP 3:** Postsecondary faculty (with advice from business and industry representatives) identify the technical proficiencies. These are typically the skills needed by students entering the postsecondary degree program.

**STEP 4:** Secondary and postsecondary faculty identify the courses that address the technical proficiencies. These can be taught at the high school or vocational-technical center.

## BLUE VALLEY SCHOOLS TECH PREP SEQUENCE

| 9                                          | 10                             | 11                             | 12                                                            |
|--------------------------------------------|--------------------------------|--------------------------------|---------------------------------------------------------------|
| ENGLISH I                                  | ENGLISH II                     | ENGLISH III                    | CONTEMPORARY COMMUNICATION                                    |
| MATH I<br>OR<br>ALGEBRA I                  | MATH II<br>GEOMETRY            | MATH III<br>ADVANCED ALGEBRA   | ALGEBRA II<br>OR<br>PRE CALC OR<br>ALGEBRA III                |
| BIOLOGICAL & PHYSICAL SCIENCE REQUIREMENTS |                                | SCIENCE & TECHNOLOGY I SYSTEMS | ADVANCED TECHNOLOGY II SYSTEMS                                |
| PHYSICAL EDUCATION                         | WORLD HISTORY                  | AMERICAN HISTORY               | AMERICAN GOVERNMENT (1/2)<br>SOCIAL STUDIES<br>ELECTIVE (1/2) |
| KEYBOARDING (1/2)<br>COMPUTER REQUIREMENT  | HEALTH (1/2)<br>ELECTIVE (1/2) | TECH PREP ELECTIVES            |                                                               |

## ENGINEERING &amp; INDUSTRIAL TECHNOLOGY CLUSTER

This sequence of courses prepares students to enter the degree programs listed below

Associate of Applied Science Degree  
Automotive Technology  
Heating, Ventilation & Air Conditioning Technology

Associate of Science Degree  
Civil Engineering Technology  
Drafting Technology  
Electronics Engineering Technology

| TECH PREP ELECTIVES*                                                 |                                                                                        |
|----------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Drafting I<br>Drafting II<br>Drafting III<br>Industrial Technology I | Automotive Technology (JC/TEC)<br>Career Exploration<br>Advanced Industrial Technology |

\*Students must take at least 2 Tech Prep Electives  
Tech Prep Electives may provide advanced standing credit at JC/CC

Chart 7.2.

**STEP 5:** Secondary and postsecondary faculty sequence the courses so that students can move easily from high school into the postsecondary degree program.

**STEP 6:** Place these courses in the appropriate squares on the grid.

**STEP 7:** Postsecondary faculty (with advice from business and industry representatives) identify the specialty proficiencies for completion of the program.

**STEP 8:** Place these courses in the appropriate squares on the grid.

## Samples for Review

Chart 7.2 contains a sample Tech Prep sequence for an engineering and industrial technology cluster. The sequence covers only the core and technical proficiencies.

Chart 7.3 contains a sample articulation agreement for Tech Prep. The agreement lays out the last 2 years of high school and 2

**Tech Prep Associate Degree Consortium of Johnson/Douglas Counties  
Articulation Agreement  
between  
Blue Valley Schools and Johnson County Community College  
in the  
Engineering & Industrial Technology Cluster  
Drafting Technology Program  
Civil Option**

| Grade 11                                                                                                                                                         | Grade 12                                                      | Grade 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Grade 14                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| English III                                                                                                                                                      | Contemporary Communication                                    | Technical Drafting                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Civil Drafting                                   |
| Math III<br>or<br>Algebra II                                                                                                                                     | Algebra II<br>or<br>Pre Calc or<br>Algebra III                | Intro to CAD Concepts                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | CAD 3-D<br>Technical Elective                    |
| Science &<br>Technology I<br>or<br>Chemistry I                                                                                                                   | Science &<br>Technology II<br>or<br>Physics                   | Intro to Personal Computers                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Technical Statics<br>& Mechanics                 |
| American History                                                                                                                                                 | American Government (1/2)<br>Social Studies<br>Elective (1/2) | PC DOS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Technical Physics I                              |
| Drafting II*                                                                                                                                                     | Drafting III*                                                 | Composition I                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Electrical Drafting                              |
| Elective                                                                                                                                                         | Elective                                                      | Technical Math I                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Structural Drafting                              |
|                                                                                                                                                                  |                                                               | CPCA Elective                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Technical Elective                               |
|                                                                                                                                                                  |                                                               | Interpreting Arch Drawings                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Social Science & or<br>Economics Elective        |
|                                                                                                                                                                  |                                                               | Intermediate CAD                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Humanities & or<br>Art Elective                  |
|                                                                                                                                                                  |                                                               | Construction Methods                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Health &<br>or<br>Physical Education<br>Elective |
|                                                                                                                                                                  |                                                               | Technical Writing I                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                  |
|                                                                                                                                                                  |                                                               | Technical Math II                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                  |
| <b>Tech Prep Electives</b><br>Industrial Technology<br>Career Exploration<br>Introduction to Computer Programming BASIC*<br>Advanced Computer Programming BASIC* |                                                               | <b>Technical Electives</b><br>Intro to Word Processing<br>Spreadsheets on Micro I<br>Database on Micro I<br>Drafting Internship I<br>Intro Electronics<br>Machine Tool Processes<br>Windows<br>Civil Drafting<br>CAD Applications<br>Drafting Intern II<br>Intro to Welding<br>Metallurgy<br><br><b>Any one of the following programming classes</b><br>Programming Algorithms<br>Basic for Engineering Technology<br>Programming Fundamentals<br>Programming for Engineering & Science |                                                  |
| *Provides advanced standing credit at JCCC.                                                                                                                      |                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                  |

Chart 7.3.



## TECH PREP ADVANCED STANDING AGREEMENT

between

**Blue Valley Public Schools and Johnson County Community College**

in the

**Business & Information Technology Cluster**

### Data Processing

The courses listed below have been reviewed by the program director and faculty at Johnson County Community College. These courses have been found to be equivalent in content and are acceptable for Advanced Standing Credit - Tech Prep. The awarding of advanced standing credit for Tech Prep is subject to the Tech Prep Advanced Standing Policies listed below.

- 1) Advanced standing credit -Tech Prep applies only to students officially enrolled in the Tech Prep Associate Degree Consortium of Johnson/Douglas Counties.
- 2) Credit will be applied only for courses identified on a Tech Prep advanced standing agreement form.
- 3) Credit will be posted on the JCCC transcript as Advanced Standing Credit - Tech Prep.
- 4) The JCCC equivalent course will be posted on the transcript.
- 5) Advanced Standing Credit - Tech Prep will be given only for a final grade of "C" or better.
- 6) The grade will be posted as "P".
- 7) Credit will be posted after 12 additional hours of JCCC credit have been successfully completed.
- 8) No fee will be assessed for the credit.
- 9) Credits may not apply toward the JCCC residency requirement.
- 10) A maximum of 12 credit hours will be accepted by JCCC for Advanced Standing Credit - Tech Prep.

#### Secondary Courses\*:

#### Johnson County Community College Courses:

| Course Number/Name | Credit Hours | Course Number/Name             | Credit Hours |
|--------------------|--------------|--------------------------------|--------------|
| Drafting II        | 1            | DRAF 120 Basic Drafting        | 2            |
| Drafting III       | 1            | DRAF 130 Intro to CAD Concepts | 3            |
|                    |              |                                |              |
|                    |              |                                |              |
|                    |              |                                |              |

\_\_\_\_\_  
Secondary Administrator

\_\_\_\_\_  
Date

\_\_\_\_\_  
Dean of Instruction

\_\_\_\_\_  
Date

\* Course outlines for each course must be attached.

Chart 7.4.

years of college (4 year map). It also identifies any overlapping curriculum for which advanced standing credit may be granted.

Chart 7.4 contains a sample Tech Prep Advanced Standing Credit form that can be used to formalize an agreement on overlapping curriculum.

## **Applied/Integrated Teaching Strategies**

Traditionally, subjects are taught as though they do not overlap. Applied/integrated teaching strategies allow subjects and disciplines to be blended together. Students begin to understand how subjects are related and why the content is useful. The courses included in your sequence for Tech Prep students must be taught using applied/integrated teaching strategies.

Applied/integrated teaching strategies shift the focus of the classroom from theory to application, use "hands-on" approaches to learning, answer the question, "Why do I need this?," build connections between academic and technical learning, and build connections among subject areas (e.g., biology and chemistry, physics and math, or music and math).

There are any number of ways to apply and integrate teaching. The following section presents some suggestions for using application and integration teaching strategies. It is crucial that these suggestions be used as a starting place and that you also look beyond these suggestions.

### **Team Teaching**

Team teaching can connect teachers and expand their skills while creating an exciting learning environment for students. The following pairs should be considered for team teaching.

#### *Academic and Technical*

This team can be a very effective approach to applying teaching strategies. The academic teacher can provide content-specific knowledge while the technical teacher provides the application for the content.

#### *Academic and Academic*

This team is most effective when two disciplines are integrated. Science and math, for example, complement each other well in the classroom. The math teacher, for example, can explain the formulas and manipulations within the science experiment.

### *Technical and Technical*

The pairing of technical teachers also works well. For example, a computer-assisted design (CAD) system can help interior design students with room layout. Most home economics teachers, however, do not have the skills to run the CAD system. Drafting students will also learn a lot about working with clients if they treat the interior design students as such.

### **Applied Academics Curriculum**

Another way to teach using application and integration is to use an "applied academic" curriculum. This is a curriculum that has been developed through a consortium process and is available for sale. "Applied academic" curricula can offer teachers direction for modifying their teaching. We recommend using caution whenever a prepackaged curriculum is purchased. Teachers must modify the curriculum to fit the needs of their students.

### *Principles of Technology*

This is an applied physics curriculum produced by the Center for Occupational Research and Development (CORD). It is designed for high school students and usually is taught in the junior and senior years.

### *Applied Mathematics*

This is a hands-on mathematics curriculum (produced by CORD) that teaches approximately the equivalent of algebra I and geometry. It was designed with occupational application "labs" that help students see how mathematics concepts are used in various jobs.

### *Applied Biology/Chemistry*

This is a hands-on curriculum designed by CORD for high school students. It combines the subjects of biology and chemistry using "real-life" applications of the concepts.

### *Applied Communication*

This is a hands-on curriculum designed by the Agency for Instructional Technology (AIT). It focuses on teaching communication skills and can be taught as an independent course or used one module at a time.

### *Workplace Readiness*

This is a three-unit curriculum designed by AIT. The curriculum can be used within a classroom or learning lab.

### *Applied Economics*

There are several different applied economics curriculum packages available. Typically, this is a high school curriculum that teaches practical application of economics concepts.

## **The Hierarchy of Integration**

The National Center for Research in Vocational Education (NCRVE) has conducted several descriptive research studies on the integration of academic and vocational education. It has identified a five-step hierarchy of integration. From simple to complex, the hierarchy includes basic infusion, advanced infusion, applied academics, curriculum alignment, and restructured schools.

Here is a description of the five levels in the hierarchy.

### **BASIC INFUSION**

Attempting to improve the academic skills of students by incorporating academic content into vocational courses

### **ADVANCED INFUSION**

Vocational and academic teachers work together to integrate academic skills into vocational classes

### **APPLIED ACADEMICS**

Curricula for academic education are modified to incorporate vocational applications

### **CURRICULUM ALIGNMENT**

Vocational and academic classes reinforce one another, both laterally and sequentially

### **RESTRUCTURED SCHOOLS**

A curriculum (formed) around an occupational specialty, depending on close alliances with the business community

In addition to teaching strategies and systemic reform models of integration, the following activities are suggested as facilitating the integration process.

- Team building
- Linking professional development activities with the establishment of a teacher team

- Allowing teachers to teach teachers
- Delegating responsibility for integration through specific assignments
- Scheduling creatively to allow time when teachers could benefit by sharing information
- Empowering teachers by allowing them to become "owners" of the integration process

## **Beginning Curriculum Changes**

Some of the curriculum changes require action by the school district as a whole, whereas other changes must be initiated and carried out at each high school. We make the following recommendations of tasks to initiate curriculum changes within the school district.

### **District Level**

1. The action team should develop the sequence of courses that covers the core competencies.
2. Appropriate representatives from the technical areas (such as business and drafting) should work with the postsecondary representatives to establish the courses that cover the technical proficiencies.

### **High School Level**

1. Each high school should begin to modify its curriculum in every discipline. Teachers should begin to use integrated/applied learning strategies, lower-level courses should be dropped from the curriculum, and alternative delivery modes should be investigated, such as team teaching and block scheduling.
2. High school counselors must become familiar with the curriculum changes being made so they can place appropriate students in the classes.

### **Postsecondary Level**

1. Career program faculty should identify entrance requirements for their program.
2. Identify advanced skills to be taught when the articulation agreements are in place.

## Reference

- Schmidt, B. June, Finch, Curtis R., & Faulkner, Susan. (1992). *Integrating vocational and academic education: A practitioner's guide*. Berkeley, CA: National Center for Research in Vocational Education.

## *Involving People From Local Businesses*

**I**nvolving business and industry in the Tech Prep program is one of the keys to success. Remember that one of the goals of a Tech Prep program is to bridge the gap between the classroom and the workplace. There are many ways to involve business and industry personnel in the Tech Prep program. Typical activities and forms of involvement are discussed below.

### **Activities to Involve Business and Industry**

1. Representatives on the steering committee
2. Representatives on work teams
3. Validation of proficiencies
4. Speakers within the classroom
5. Curriculum writing
6. Classroom/work exchange
7. Shadowing/mentorships/internships
8. Apprenticeships

### **1. Representatives on the Steering Committee**

Most Tech Prep programs have representatives from business and industry serving on the steering committee. Not only is their expertise helpful in designing the program, but their involvement helps them to "buy in" early in the project.

### **2. Representatives on Work Teams**

As the consortium steering committee creates various work teams to design and implement the program, you will find expertise available in business and industry representatives. Including these individuals on the work teams provides you with expertise and provides involvement from the business representative.

### **3. Validation of Proficiencies**

It is important to know that the proficiencies addressed in the program represent current workplace skills. Representatives from various fields can help validate the proficiencies within the program. When asking for validation of proficiencies, be sure to ask a worker who is currently employed in that position. Sometimes managers are removed from the everyday activities of employees.

### **4. Speakers Within the Classroom**

Most business and industry personnel are happy to talk with students about a given topic. We suggest providing specific information about what you would like the speaker to address, time available, and who the audience will be. Most people are only too happy to help.

### **5. Curriculum Writing**

Business and industry personnel are very familiar with workplace skills. Tasks that are everyday business activities can make excellent learning experiences for students. For example, dealing with a full "in basket" is a typical business task. Students can learn a great deal about decision making by attempting to handle their own "in basket." Getting employees involved in writing curriculum is an excellent way to modify the classroom. This can be done through the consortium or through an individual school.

### **6. Classroom/Work Exchange**

Suppose that teachers could exchange places with employees of a local business. The exchange program should be well defined in

advance, outlining such details as length of exchange and duties of each person on the "new" job. Imagine the walls that would drop after spending a day in a totally new job!

Business representatives are used to serving on teams that are "active," rather than teams that discuss and debate. Be sure that your teams are action oriented. This will help you maintain the involvement of business and industry representatives.

### **7. Shadowing/Mentorships/Internships**

When people think of shadowing, mentorships, and internships, they typically think of students. It would be just as powerful for teachers and staff to participate in these kinds of programs. Before teachers will recommend an activity to students, they must believe it is worthwhile.

### **8. Apprenticeships**

Business and industry personnel are essential to developing effective apprenticeship programs. It is difficult for some educators to "let go of the power" in this type of education experience. Many trade areas have specific apprenticeship requirements. You should consult local trade unions for additional information.

## **Whose Responsibility Is It?**

Educators often want to know whose responsibility it is to get business and industry involved in the Tech Prep program. Some tasks can be handled by the consortium coordinator, but some must be taken on by the local district.

Business and industry representatives who serve on the steering committee or work teams typically are appointed by the consortium. The consortium also can handle validating the proficiencies. Other activities, such as arranging speakers within the classroom, curriculum writing, classroom/work exchange, and shadowing/mentorships/internships, can be initiated by a local school. The Tech Prep action or building team probably should take responsibility for initiating these kinds of activities.

The business and industry survey (Figure 8.1) can be used—after a presentation has been given to a chamber of commerce, Optimist club, or other business organization—to obtain names of people who are willing to help your Tech Prep efforts.

### BUSINESS & INDUSTRY SURVEY

The Tech Prep project is building technical education programs which begin in high school and culminate with a two year associate degree or certificate. The program includes a sequence of courses which are grounded in workplace application. In order to build an effective program we need your input. Would you, or someone in your organization, be willing to help us bring education and the workplace closer together?

Please check any of the areas below in which your organization would be willing to help us. THANKS!

☐ Establish work competencies for a program. Check the particular area below:

☐ General workplace skills

☐ Business Technologies

☐ Merchandising

☐ Engineering Technologies

☐ Industrial Technologies

☐ Health Technologies

☐ Human Services

☐ Other \_\_\_\_\_

☐ Validate work competencies

☐ Provide an internship for a teacher

☐ Provide an internship for a student

☐ Allow students and educators to visit your workplace

☐ Work with a school to help the teachers implement workplace applications in the classroom

☐ Serve as a guest speaker

☐ Serve as an advisor to a local school

☐ I am unable to help you right now, however, I would like to be kept informed about the project.

Please let us know how we can reach you.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Organization

\_\_\_\_\_  
Mailing Address

\_\_\_\_\_  
Phone

# 9

## *Promoting Your Program*

**T**he program must be promoted by the consortium and the local schools. Each member of the consortium should promote the Tech Prep program in the home district. The promotion work team should coordinate consortium efforts to promote the Tech Prep program. The action and building teams should also work on promoting the program within the districts.

### **Steps in Building a Campaign**

The steps in designing a promotion "campaign" are relatively simple, although the process of actually designing the campaign usually is not so simple. The steps identified below should help focus promotion efforts whether they are performed by the consortium or by a local school.

#### **What Audience Do You Want to Reach?**

The first step in any promotion campaign is to identify your audience. Usually, there are several groups of people you will want to reach. Identifying as many of these groups as you can will make the message easier to design.

Typical audiences for Tech Prep promotion campaigns include teachers, students, parents, business and industry personnel, local community members, school board members, and chamber of commerce executive board members.

### **What Do You Want the Audience to Do or Believe?**

Ultimately, the goal of a promotion campaign is to get some action or change in belief from your audience. When identifying the outcome(s) you want from your audiences, be as specific as you can. Remember that it is possible to have more than one outcome for a single audience.

Typical outcomes of a Tech Prep promotion campaign may include the following:

**Teachers:** Adapt teaching strategies to include application and integration.

**Students:** Enroll in the Tech Prep program.

**School Board:** Actively promote the Tech Prep program within the district.

### **What Does the Audience Already Know or Believe?**

Finding out what your audience already knows about a Tech Prep program and related issues is helpful in designing the campaign. You need to know at least whether to expect a hostile or supportive reception! Below are three common methods of gaining this information:

- Survey (written, phone)
- Informal networking (talking with community representatives)
- Local environmental scan (newspaper, radio, editorials)

The method you use to identify what the audience already knows should fit your local situation. For example, some small school districts are keenly aware of their parents', students', and local community's perceptions. Consequently, a less formal data collection process is necessary.

### **How Can You Reach the Audience?**

It is important to identify methods that can be used to reach your audiences. You may be able to reach more than one audience with the same method. Typical methods used to reach Tech Prep audiences include:

- Public presentations
- Written communication (brochures, newsletters)
- Newspaper articles
- Special events
- Radio announcements

Once you have identified the audience, outcome, perceptions and methods, you can begin to design the activities to accomplish your goal.

For example:

**AUDIENCE:** Students

**DESIRED OUTCOME:** Enroll in Tech Prep

**PERCEPTIONS:** Unaware of Tech Prep, unaware of employment options

**METHODS:** Video, student newspaper, announcements, posters, counselor conferences, teacher encouragement, Tech Prep activities

The promotion work team should decide which activities it will perform and which activities might be performed by the local schools. Some promotion efforts should be performed by the consortium, whereas others must be accomplished by each school district. A video, for example, usually is a consortium product, whereas an advertisement in the school newspaper might be local to each high school.

The final piece of the promotion campaign is to design and "send" the message itself. Identify which of the methods you wish to use in the campaign. This may be done by the consortium promotion work team or by the action/building teams. For each message to be designed, you should answer the questions below:

1. What steps must be taken to create this message?
2. Who will be responsible for the activity?
3. What is the time frame to complete this activity?

**Example:** Audience = Students Method = Video

*What steps must be taken to create this message?*

1. Obtain/create the video
2. Identify which students will see the video
3. Identify when students will see the video
4. Plan feedback/discussion

*Who will be responsible for this activity?*

1. Media coordinator will secure the video
2. Assistant principal will coordinate identification of students and set the schedule for viewing the video
3. Teachers will run the feedback session

*What is the time frame for this activity?*

1. Video selected by November
2. Identification of students and viewing schedule completed by December
3. Viewing and feedback sessions during February

### Promotion Worksheet

Take a moment to complete this worksheet to organize your promotion campaign.

1. Identify the audience you want to reach.

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2. What action or belief do you want from this audience?

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3. Describe what the audience already knows or believes about Tech Prep.

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**Promotion Worksheet, Continued**

4. How can you reach this audience?

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What steps must be taken to create this message?

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Who will be responsible for this activity?

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What is the time frame for this activity?

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## *Tracking Your Success*

**E**valuation is an important piece of any reform process. Although we are not evaluation experts, we do want to introduce some of the issues you will deal with as you evaluate Tech Prep. We strongly advise consulting with evaluation experts in designing an evaluation plan.

### **Answering Key Questions About Evaluating Tech Prep**

It is just now possible to draw conclusions about the effectiveness of Tech Prep programs that began many years ago. It is important to generate some baseline data on your students and programs so that you will have a comparison point.

There are several key questions to be answered in designing an evaluation plan for Tech Prep. These questions should be used by the evaluation work team.

#### **How Will the Data Be Used?**

We suggest that you discuss what will be done with the results of your evaluation. Is the evaluation being conducted for federal, state, or local administrative reporting, and/or local promotion of

the program? Knowing how the data will be used will help ensure that you collect the appropriate data.

### **What Data Elements Will Be Collected?**

Generally, you will want to collect some demographic data about the students in the program. These data help you describe your population and make comparisons to other populations. You may also want to collect academic performance indicators on students (e.g., test scores, grades). These can be used to show increased student performance. Consider the availability of pre- and posttest scores. Another kind of data you may want to collect is descriptive data from students, for example, a measure of how they feel about the program.

### **Where Are the Data Available?**

Consider where you will be able to obtain the data you want to collect. Some information will be housed in the school district office or the high school itself. Still other information may need to be collected from students in a survey format.

### **How Will the Data Be Maintained?**

Consider what resources are available for maintaining the data. Can they be kept on a computer system, or will they be on paper? The answer to this question may determine how much data you collect and the kinds of reports you can generate.

## **How Can Immediate Gains Be Measured?**

Schools can begin to measure changes by monitoring some local elements. We suggest that each high school keep track of the following kinds of information as the changes come on line.

1. Enrollments in courses affected by curriculum changes.
2. Number of students enrolled in science and math courses.
3. Sections of study hall offered.
4. Student grades.
5. Scores on standard tests taken by students.
6. Students' and teachers' perceptions of the changes.
7. Parents' perceptions of the changes.

All this information can be reported to local audiences such as the board of education, parents, and community groups.

**Evaluation Worksheet**

1. Identify how the data you collect will be used.

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2. List the data elements you will collect and identify the source for each element.

DATA ELEMENT

SOURCE

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3. Describe how the data will be maintained.

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# Resource A:

## Definitions

**Action team:** A team created within a school district to handle decisions and activities that affect the school district as a whole.

**AIT:** The Agency for Instructional Technology, which produces curriculum packages (e.g., Applied Communication and Workplace Readiness).

**Application teaching strategies:** Those teaching strategies that promote the learning of practical applications. These teaching strategies respond to the question, "When will I ever use this?"

**Applied academics:** A prepackaged curriculum that teaches traditional academic subjects in a hands-on fashion.

**Articulation agreement (Tech Prep):** An agreement that lays out a sequence of courses bridging the high school and the postsecondary institution. Articulation agreements typically focus on career programs.

**Articulation team:** A group of faculty (secondary and postsecondary) who are responsible for developing articulation agreements.

**Building team:** A group of high school teachers and staff members responsible for implementing Tech Prep within a high school.

- Business and industry involvement work team:** A work team created by the Tech Prep steering committee that is responsible for getting business and industry representatives involved in the Tech Prep project.
- Career cluster:** A group of related occupations in which there are 2 year degree or certificate programs available.
- Consortium (Tech Prep):** A group of schools that work together to develop a Tech Prep program. It must have a minimum of one secondary and one postsecondary school.
- CORD:** The Center for Occupational Research and Development. It produces applied curriculum packages (e.g., Applied Mathematics, Applied Biology/Chemistry, and Principles of Technology).
- Core proficiencies:** The required skills in mathematics, science, communication, and technology required of all Tech Prep students.
- Curriculum work team:** A team created by the Tech Prep steering committee to oversee curriculum changes that affect all consortium schools.
- Evaluation work team:** A team created by the Tech Prep steering committee to build and implement an evaluation plan.
- Integration teaching strategies:** Those teaching strategies that build connections among subjects and disciplines (e.g., biology and chemistry, history and mathematics).
- NCRVE:** National Center for Research in Vocational Education.
- Neglected majority:** The group of students who are not enrolled in a traditional college preparatory or vocational preparatory sequence.
- Postsecondary school:** A community college or technical school.
- Promotion work team:** A team created by the Tech Prep steering committee to design and implement a promotion campaign for Tech Prep.
- SCANS:** Secretary's Commission on Achieving Necessary Skills.
- Secondary school:** A high school, typically housing Grades 9-12 or 10-12.
- Sequence of courses:** A nonduplicative progression of courses recommended for Tech Prep students. A sequence includes academic and technical courses on the secondary and post-secondary levels.
- Specialty proficiencies:** The skills required for successful employment in a specific occupation.

**Steering committee (Tech Prep):** The main committee responsible for the implementation of a Tech Prep program. Members typically include at least one representative from each member of the consortium and business and industry representatives.

**Tech Prep:** A technical education program beginning in high school and culminating with an associate degree or 2 year certificate.

**Technical proficiencies:** The introductory skills within a career cluster or program.

# *Resource B:*

## *Core Proficiencies*

The following proficiencies were identified by the Tech Prep Associate Degree Consortium of Johnson/Douglas Counties.

### **Core Proficiencies**

#### **Science**

1. Demonstrate the science process skills.  
The student should be able to correctly observe, analyze data, conduct an experiment, etc.
2. Demonstrate an acceptable level of specific content.  
The student should be able to demonstrate knowledge of systems, biological processes, physical principles, etc.
3. Apply the science process skills to investigating problems.  
The student should design and/or perform laboratory experiments to investigate various phenomena.
4. Recognize the interrelationships of science, technology, health, and the environment.  
Interrelationships should provide the student with an understanding of how technology, environmental, and health

industries draw on scientific principles to resolve problems. Courses should incorporate computer usage.

5. Work independently, collaboratively, and safely.

Courses should include exercises that allow both independent and collaborative experiences. Safety concepts and principles should be incorporated throughout the courses.

### **Mathematics**

All Tech Prep students should have, as a minimum, preparation for college algebra before entering the postsecondary portion of the Tech Prep program.

1. Apply mathematical problem-solving strategies to problems both within and outside mathematics.

Understand algebraic concepts, geometry concepts, functions, probability and statistics, and discrete mathematics.

2. Recognize mathematics as an integrated whole.

Make connections among mathematical topics, between mathematics and other disciplines, and between mathematics and real-world applications.

3. Communicate mathematically using the language and symbols of mathematics.

Understand estimation, formal proofs, and inductive/deductive reasoning.

### **Technology**

1. Understand the role of technology in today's marketplace.

Understand the impact of technology advancement on business, industry, and the job market. Technologies might include artificial intelligence and biogenetics.

2. Demonstrate computer literacy skills.

Understand the components of computers, demonstrate software application skills, and understand basic file management techniques for computers.

3. Comprehend the impact of technology on various social systems.

Understand the impact of technology on the economy, public safety, and family life.

## Communication

1. Comprehend and interpret written, oral, and visual language in a variety of forms for real-life purposes.

Understand forms of communication specific to the workplace, such as forms, diagrams, manuals, graphs, directions, correspondence, resumes, and presentations. Recognize the purpose and intent of a variety of forms of communication.

2. Express ideas through written, oral, and visual language for a variety of real-life purposes and audiences.

Apply a process approach to express ideas. Produce a variety of forms of communication appropriate to purposes and audiences.

3. Demonstrate interpersonal skills through effective interaction with others.

Work closely with others to accomplish tasks. Communicate appropriately in pressure situations. Deal effectively with the public.

4. Develop lifelong communication skills necessary to function productively in diversified work groups.

Assess and synthesize information. Apply critical and inventive thinking when solving problems. Use current technology systems as tools.

## Workplace

1. Manage resources of time, money, materials, and energy.
2. Acquire, organize, analyze, and communicate information.
3. Utilize, maintain, and troubleshoot current technologies.
4. Analyze social, organizational, and technological systems.
5. Employ the interpersonal skills of teamwork, leadership, negotiating, and working with diverse populations and cultures.
6. Apply the critical thinking skills of decision making, problem solving, creative thinking, and reasoning.
7. Display the personal qualities of responsibility, self-esteem, sociability, self-management, and integrity.
8. Recognize social and environmental issues to protect, enhance, and preserve the quality of life.

### Career Development

1. Demonstrate the role of self-knowledge in career development.  
Identify values, interests, abilities, skills, work environment factors, life roles, and constraints as they relate to an individual's career life.
2. Demonstrate an awareness of the world of work, career opportunities, and career pathways.  
Engage in career-related experiences (career fairs, shadowing, internships, volunteering, informational interviewing, etc.). Demonstrate knowledge of career rewards and requirements. Recognize trends in future jobs, the economy, and the labor market. Assess and use opportunities for lifelong learning. Conduct research using various resources such as print and video.
3. Apply the critical thinking skills of decision making and goal setting as they relate to career development.  
Identify effective decision-making strategies. Use decision-making strategies to set career life goals.
4. Develop personal and professional employment strategies.  
Demonstrate effective employment strategies (resume writing, interviewing, job search techniques, etc.). Demonstrate the ability to maintain employment.

# Resource C:

## Tech Prep Checklist

| <i>Organizing</i>                                          | <i>Responsibility</i>                 | <i>Planned</i> | <i>In Progress</i> | <i>Completed</i> |
|------------------------------------------------------------|---------------------------------------|----------------|--------------------|------------------|
| Has a consortium been established?                         | Leaders of participating institutions |                |                    |                  |
| Has a steering committee been established?                 | Leaders                               |                |                    |                  |
| Is there a Coordinator/Director of the consortium?         | Steering Committee                    |                |                    |                  |
| Have the functions of the consortium been identified?      | Steering Committee                    |                |                    |                  |
| Has funding for the consortium been secured?               | Steering Committee                    |                |                    |                  |
| Have conditions for consortium membership been identified? | Steering Committee                    |                |                    |                  |
| Has a written agreement been developed and signed?         | Steering Committee                    |                |                    |                  |
| Have vision and mission statements been developed?         | Steering Committee                    |                |                    |                  |
| Have program parameters been set?                          | Steering Committee                    |                |                    |                  |
| Have career clusters been identified for development?      | Steering Committee                    |                |                    |                  |
| Have work teams been created?                              |                                       |                |                    |                  |
| Curriculum                                                 | Steering Committee                    |                |                    |                  |
| Evaluation                                                 | Steering Committee                    |                |                    |                  |
| Promotion                                                  | Steering Committee                    |                |                    |                  |
| Business & Industry                                        | Steering Committee                    |                |                    |                  |

(continued)

| <i>Organizing</i>                                                             | <i>Responsibility</i>   | <i>Planned</i> | <i>In Progress</i> | <i>Completed</i> |
|-------------------------------------------------------------------------------|-------------------------|----------------|--------------------|------------------|
| Has an action team been created?                                              | Action Chair            |                |                    |                  |
| Are their goals clear?                                                        | Action Chair            |                |                    |                  |
| Do they have a plan?                                                          | Action Chair            |                |                    |                  |
| Are they meeting regularly?                                                   | Action Chair            |                |                    |                  |
| Have building teams been created?                                             | Building Chair          |                |                    |                  |
| Are their goals clear?                                                        | Building Chair          |                |                    |                  |
| Do they have a plan?                                                          | Building Chair          |                |                    |                  |
| Are they meeting regularly?                                                   | Building Chair          |                |                    |                  |
| Have articulation teams been created?                                         | Postsecondary Dean      |                |                    |                  |
| Have application/integration teams been created?                              | Postsecondary Dean      |                |                    |                  |
| <i>Curriculum</i>                                                             | <i>Responsibility</i>   | <i>Planned</i> | <i>In Progress</i> | <i>Completed</i> |
| Have core proficiencies been developed?                                       | Curriculum Work Team    |                |                    |                  |
| Have the core proficiencies been validated by business & industry?            | Curriculum Work Team    |                |                    |                  |
| Have the career clusters been defined?                                        | Steering Committee      |                |                    |                  |
| Has a sequence of courses (for the core proficiencies) been created?          | Action/Building         |                |                    |                  |
| Have applied/integrated teaching strategies been initiated?                   | Action & Building Teams |                |                    |                  |
| Applied Academics                                                             | Action & Building Teams |                |                    |                  |
| Team Teaching                                                                 | Action & Building Teams |                |                    |                  |
| Curriculum Alignment                                                          | Action & Building Teams |                |                    |                  |
| Restructured Schools                                                          | Action & Building Teams |                |                    |                  |
| <i>Promotion</i>                                                              | <i>Responsibility</i>   | <i>Planned</i> | <i>In Progress</i> | <i>Completed</i> |
| Has the promotion work team developed a plan?                                 | Promotion Work Team     |                |                    |                  |
| Have introductory promotion materials been produced?                          | Promotion Work Team     |                |                    |                  |
| Are the member schools being supplied with appropriate promotional materials? | Promotion Work Team     |                |                    |                  |
| Are local audiences being made aware of Tech Prep?                            | Action & Building Teams |                |                    |                  |

| <i>Business &amp; Industry Involvement</i>                                                                                 | <i>Responsibility</i>         | <i>Planned</i> | <i>In Progress</i> | <i>Completed</i> |
|----------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------|--------------------|------------------|
| Is the business & industry involvement work team actively recruiting business representatives to be involved in Tech Prep? |                               |                |                    |                  |
| Representatives on Steering Committee                                                                                      | Bus/Ind Involvement Work Team |                |                    |                  |
| Representatives on Work Teams                                                                                              | Bus/Ind Involvement Work Team |                |                    |                  |
| Validating proficiencies                                                                                                   | Bus/Ind Involvement Work Team |                |                    |                  |
| Are local schools involving business/industry in their efforts?                                                            |                               |                |                    |                  |
| Classroom Speakers                                                                                                         | Action & Building Teams       |                |                    |                  |
| Classroom/Work Exchange                                                                                                    | Action & Building Teams       |                |                    |                  |
| Shadowing/Mentorship/Internship                                                                                            | Action & Building Teams       |                |                    |                  |
| <i>Inservice</i>                                                                                                           | <i>Responsibility</i>         | <i>Planned</i> | <i>In Progress</i> | <i>Completed</i> |
| Have the key players in the consortium been inserviced?                                                                    | Director/Coordinator          |                |                    |                  |
| Have the mentor schools identified local groups to receive inservice?                                                      | Action Team                   |                |                    |                  |
| Have arrangements been made to provide this inservice?                                                                     | Director/Coordinator          |                |                    |                  |

# *Bibliography and Sources for More Information*

This list represents some of the resources available on Tech Prep and related topics.

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- Wacker, Gabrielle Banick. (1993). *Tech prep: Effective and promising practices guide*. Madison: Center on Education and Work, University of Wisconsin-Madison.
- Wirth, Arthur G. (1992). *Education and work for the year 2000: Choices we face*. San Francisco: Jossey-Bass.

We recommend contacting the following resource centers:

**National Network for Curriculum Coordination**

Sangamon State University  
Springfield, Illinois  
(217) 768-6375

**National Center for Research in Vocational Education**

University of California, Berkeley  
Berkeley, California  
(800) 762-4093

**Office of Vocational and Adult Education**

U.S. Department of Education  
Washington, D.C.  
(202) 205-5440

**National Tech Prep Network**

Center for Occupational Research and Development  
Waco, Texas  
(800) 972-2766

The following list represents some of the Tech Prep programs that are in full operation:

Tri-County Technical College, South Carolina  
Portland Community College, Portland, Oregon  
Community College of Rhode Island, Rhode Island  
Mount Hood Community College, Oregon



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# Tech Prep Career Programs

## *A Practical Guide to Preparing Students for High-Tech, High-Skill, High-Wage Opportunities*

Revised Edition

**Carol Fagan**

Johnson County Community College, Overland Park, Kansas

**Dan Lumley**

Spring Hill Schools, Spring Hill, Kansas

Here are the tools you need to effectively plan, develop, and implement a technical preparation program in your school, district, and community.

Preparing students for successful careers is one of the key challenges facing educators today. Use this practical, step-by-step guide to help prepare your students with basic skills, specific workplace skills, and a stronger sense of responsibility. *Tech Prep Career Programs* shows how you can link your high school with community colleges, technical schools, and businesses in your community. Collaboration between schools and local businesses provides your students with the core, technical, and specialized skills they'll need to compete in today's rapidly changing economy. Your Tech Prep program will prepare your students for high-skill, high-wage careers.

*Tech Prep Career Programs* shows how you can

- Form a Tech Prep consortium, the collaborative partnership
- Secure funding for your school-to-career Tech Prep program
- Organize action teams within the consortium, local school districts, and postsecondary schools
- Define and implement the necessary curriculum changes
- Involve business and industry leaders
- Promote and evaluate your Tech Prep program

Written to help district and local administrators and other educators with little or no experience in Tech Prep, as well as those seeking to improve existing programs. Includes transparency masters, sample course sequences, core proficiencies, articulation agreements, survey instruments, sample letters, and checklists to make your job easier and to monitor program success. Newly revised and updated from the 1995 edition.



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